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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 12/000,234 | 12/11/2007 | Andrew D. Hibbs | QFS010 | 2850 |

7590 02/27/2018

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|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 2858 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 02/27/2018 | PAPER |

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ANDREW D. HIBBS and THOMAS KURT NIELSEN[1]

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Appeal 2016-005553
Application 12/000,234
Technology Center 2800

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Before BEVERLY A. FRANKLIN, KAREN M. HASTING, and CHRISTOPHER L. OGDEN, *Administrative Patent Judges*.

FRANKLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] Appellants identify the real party in interest as Quasar Federal Systems, Inc. Appeal Br. 4.

Appellants request our review under 35 U.S.C. § 134 of the Examiner's decision rejecting claims 1–14 and 19–28. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We reverse.

## STATEMENT OF THE CASE

Claim 1 is illustrative of Appellants' subject matter on appeal and is set forth below:

> 1. A system for measuring magnetic and electric fields present in an electrically conducting medium, the system comprising:
>
> a group of components constituting an integrated sensor package including:
>
> two magnetic sensors, each magnetic sensor having a magnetic field induction coil for producing a magnetic field signal and a magnetic field signal amplifier connected to the induction coil for producing an amplified magnetic field signal based on the magnetic field signal, each induction coil being disposed so as to measure fields in orthogonal directions;
>
> two electric field sensors, each electric field sensor having an electric field signal amplifier connected to at least two electric potential antennas for producing an amplified electric field signal, each electric field sensor being disposed so as to measure fields in orthogonal directions, the at least two electric potential antennas each including a respective capacitive electrode being adapted to measure an electric potential and having a conducting core and an electrically insulative layer covering the core, said insulative layer preventing transfer of a resistive current from the core to the medium;
>
> a data acquisition system for receiving the amplified electric field signals and the amplified magnetic field signals and storing data representative thereof; and
>
> a power supply for providing electrical power to the data acquisition system, the electric sensors and the magnetic sensors.

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

| | | |
|---|---|---|
| Jones | US 2,872,638 | Mar. 31, 1955 |
| Chaney | US 3,593,118 | July 13, 1971 |
| Stanbro | US 4,728,882 | Mar. 1, 1988 |
| Constable | US 5,770,945 | June 23, 1998 |
| Webb | US 6,512,356 B1 | Jan. 28, 2003 |
| Conti | US 6,842,006 B2 | Jan. 11, 2005 |
| Hibbs | US 2005/0073302 A1 | Apr. 7, 2005 |

THE REJECTIONS

1. Claims 10 and 21 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.[2]

2. Claims 1, 3, 5, 6, 8, 10, 11, 12, 14, 19, 20, 23, 24, 26, 27, and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Constable in view of Stanbro et al. ("Stanbro") or Jones.

3. Claims 2, 4, 13, and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Constable in view of Stanbro or Jones and in further view of Hibbs et al. ("Hibbs").

4. Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Constable in view of Stanbro or Jones and in further view of Chaney et al. ("Chaney").

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[2] In the Advisory Action dated August 5, 2015, the Examiner withdrew the rejection of claims 2, 4, and 5 in this rejection. On page 2 of the Answer, the Examiner also withdrew the rejection of claim 9 in this rejection. Claims 10 and 21 remain rejected.

5. Claims 9 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Constable in view of Stanbro or Jones and in further view of Webb.

6. Claim 25 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Constable in view of Stanbro or Jones and in further view of Conti et al. ("Conti").

ANALYSIS

Upon consideration of the evidence and each of the respective positions set forth in the record, we find that the preponderance of evidence supports Appellants' position in the record, and accordingly, we reverse each of the Examiner's rejections on appeal.

Rejection 1

With regard to claim 10, the Examiner states that the claimed phrase "of the at least four electric potential antennas" lacks antecedent basis and is therefore unclear. The Examiner states that "[w]hile claim 1 does recite that each electric field sensor is connected to at least two electric potential antennas, this does not mean that each sensor cannot be connected to the same two potential antennas, and as such there is not necessarily four antennas." Final Act. 8.

On page 10 of the Appeal Brief, Appellants argue that while claim 1 does not specifically recite "at least four electric potential antennas", claim 1 does recite "two electric field sensors, each electric field sensor having an electric field amplifier connected to at least two electric potential antennas" and that when read in light of the Specification, claim 1 does allow for antecedent basis for four electric potential antennas.

In response, the Examiner states that claim 1 states "each electric field sensor having an electric field amplifier connected to at least two electric

potential antennas." Ans. 3. The Examiner states that therefore each electric field sensor has an electric field amplifier, but the claim does not clearly state or require that each electric field sensor also has at least two electric potential antennas. *Id.* The Examiner states that the claim only requires that the electric field amplifiers are connected to at least two electric potential antennas. In other words, this claim can be interpreted as meaning that each electric field sensor includes an amplifier, and that there are two electric potential antennas, where the amplifier of each electric field sensor is connected to these two electric potential antennas. Ans. 3–4. The Examiner states that therefore claim 1 can reasonably be read to mean that there are only two electric potential antennas introduced in claim 1, and therefore the recitation in claim 10 of "the at least four electric potential" is unclear and lacks antecedent basis because Appellants do not clearly have four electric potential antennas in claim 1.

We note that a claim must be read in accordance with the precepts of English grammar. *In re Hyatt*, 708 F.2d 712, 715 (Fed. Cir. 1983). There is a heavy presumption that a claim term carries its ordinary and customary meaning. *Amgen, Inc. v. Hoechst Marion Rousel, Inc.,* 314 F.3d 1313, 1327. In the instant case, the phrase "two electric field sensors, each electric field sensor having an electric field signal amplifier connected to at least two electric potential antennas for producing an amplified electric field signal" plainly means that each electric field amplifier is connected to at least two potential antennas in a manner for producing an amplified electric field signal. In order to produce the amplified electric field signal, each electric field amplifier cannot be connected to the same at least two electric potential antennas. As such, we agree with Appellants that each electric field amplifier is connected to respective at least two electric potential antennas. Figure 4 depicts such a configuration. This is not to say that limitations from

the Specification are being read into the claims as stated by the Examiner on page 5 of the Answer. Rather, the claim requires such a configuration "for producing an amplified electric field signal" which is recited in the claim. We are thus persuaded by Appellants' arguments pertaining to claim 10.

With regard to claim 21, the Examiner states that the phrase "minimizing a DC potential difference between the electrodes and the water in order to minimize electrochemical noise at the electrodes" is not understood in that it is not clear how Appellants are performing this claim feature or what feature of the original disclosure performs this feature. Final Act. 8.

Appellants argue that cited sections of the Specification on pages 10–11 of the Appeal Brief show that it is electrical isolation that is used to minimize a DC potential difference between the electrodes and water. Appellants refer to page 8 and page 44 of the Specification in this regard. Appeal Br. 10–11.

On pages 6–8 of the Answer, the Examiner responds by stating that the parts of the Specification relied upon by Appellants do not adequately support the function of minimizing the DC potential to minimize electrochemical reactions at the electrode, for the reasons discussed therein.

In reply, Appellants argues that the Examiner's interpretation of page 44 is out of context. Reply Br 3–4. Therein, Appellants argue that the Examiner acknowledges that the section of the Specification cited by the Applicant (p. 44, line 22 to p. 45, line 10), discloses "that the difference between the average DC potential to the input of the amplifier module and the medium can be minimized," but denies that the cited section refers to the claimed minimizing of electromagnetic noise at the electrodes. Appellants explain that the sentence in the Specification, just before the section cited, refers to the electrochemical reactions at each electrode surface. Appellants explain that, in other words, by reducing the difference between the average DC potential to the input of the amplifier module

and the medium, one also is minimizing a DC potential difference between the electrodes and the water in order to minimize electrochemical noise at the electrodes. Reply Br. 4. Appellants submit that therefore the cited section of Specification provides several ways of accomplishing this minimization. We are persuaded by this argument.

Appellants also reply that the Examiner then requires an explanation of what structure is used to perform the claimed minimization. Reply Br. 4. Appellants submit that this method claim is supported by the Specification and one skilled in the art would know to conduct the method with one of the many embodiments disclosed in the Specification. Appellants state that, for example, one would know to employ at least one of the following two described arrangements (Spec. p. 44, l. 15 – p. 45, l. 10), reproduced below:

> An amplifier consisting of an analog amplification module is connected to an electrically isolated battery power supply and circuit ground point. The output of the analog amplification chain is connected to an analog optical isolation stage which serves as the interface to a digitizing module, which itself is referenced to the DC potential of the other system elements, for example the magnetic field amplifiers.
>
> Alternatively, the analog amplification module and digitizing module are connected to a common, electrically isolated, battery power supply and circuit ground point, and the output of the digitizing module is connected to a digital optical isolation stage, which serves as the interface to the DC electrical potential of the recording system and other system elements.

In view of the above, we are persuaded by Appellants stated position in the record regarding claim 21.

We thus reverse Rejection 1.

Rejection 2

The dispositive issue in this rejection is whether the Examiner's equivalency theory is supported by the facts in the record. The Examiner proposes to substitute the non-polarizing electrode (resistive electrode) with the capacitive electrode of Stanbro or Jones. Final Act. 10–11.

Appellant argues that because Constable discloses that any non-polarizing electrodes can be used, that this excludes the claimed capacitive electrode which is a polarizing electrode. As such, Appellants submit that it would not have been obvious to have substituted a polarization electrode for the non-polarization electrode of Constable. Appeal Br. 12.

The Examiner states that "[n]owhere does Constable state that other types of electrodes cannot be used" and that "Constable further does not state that capacitive electrodes cannot be used in place of the disclosed electrodes." Ans. 9. The Examiner also relies upon the art recognized equivalence theory in support of the proposed substitution. Ans. 9–10. The Examiner states that nothing in the combination precludes the use of a different type of electrode such as a capacitive electrode. Ans. 12.

However, we are in agreement with Appellants' stated position in the record. First, it is well settled that the Examiner bears the initial burden of presenting a *prima facie* case of unpatentability. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). It is thus the Examiner's burden to show art recognized equivalence. As pointed out by Appellants, and contrary to the Examiner's understanding of Constable, Constable is limited to the use of non-polarizing (resistive) electrodes only. Constable, col. 6, ll. 5–7. Appeal Br. 12. Reply Br. 5. Also, as pointed out by Appellants, resistive electrodes and capacitive electrodes are no more substitutes for each other than resistors are for capacitors. Reply Br. 6. Appellants point out that resistive

electrodes do not work the same way as capacitive electrodes and nowhere does the prior art recognize their equivalence. Reply Br. 6.

In view of the above, we are persuaded that the Examiner's equivalency theory is unsupported by the facts in the record, and that the Examiner's understanding of Constable is not accurate, and thus we agree with Appellants that the Examiner's rejection is unsupported by the record. Rejections 3 and 4 are flawed in a similar manner. We thus reverse Rejections 2–4.

## DECISION

Each rejection is reversed.

## ORDER

REVERSED