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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANATOLY N. VERENCHIKOV and ALEKSEY VOROBYEV

Appeal 2019-002171
Application 15/301,249
Technology Center 2800

Before JEFFREY W. ABRAHAM, CHRISTOPHER L. OGDEN, and
MICHAEL G. McMANUS, *Administrative Patent Judges*.

ABRAHAM, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the
Examiner’s decision to reject claims 1–16. We have jurisdiction under
35 U.S.C. § 6(b).

We REVERSE.

¹ 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 Leco Corporation.
Appeal Br. 2.

CLAIMED SUBJECT MATTER

The claims relate to time-of-flight mass spectrometers. Spec. ¶ 1. Claims 1 and 11, reproduced below from the Claims Appendix, are illustrative of the claimed subject matter:

1. A time-of-flight detector, comprising:
 - a conductive converter exposed parallel to a time-front of detected ion packets and generating secondary electrons;
 - at least one electrode with a side window, wherein the converter is negatively floated relative to the electrode by a voltage difference between 100V and 1000V;
 - at least one magnet with magnetic field strength between 10 Gauss and 1000 Gauss for bending electron trajectories towards said side window;
 - a scintillator floated positively relative to a surface of said converter by 1kV to 20kV and located past said side window at 45 degrees to 180 degrees relative to said converter; and
 - a sealed photo-multiplier past said scintillator.

Appeal Br. 10 (Claim Appendix).

11. A right angle time-of-flight detector, comprising:
 - a single microchannel plate for converting detected ion packets into secondary electrons;
 - an electrostatic bender of secondary electron;
 - a scintillator floated positively relative to said microchannel plate by 1kV to 20kV and located past said microchannel plate at 45 degrees to 90 degrees; and
 - a sealed photo-multiplier past the scintillator.

Appeal Br. 11 (Claim Appendix).

REJECTIONS ON APPEAL

On appeal, the Examiner maintains the following rejections

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- A. Claims 11, 12, and 14 under 35 U.S.C. § 112(b) as being indefinite;
- B. Claims 1–10 and 15 under 35 U.S.C. § 103 as unpatentable over Applicant’s Admitted Prior Art (AAPA), Stresau,² and Kotani;³
- C. Claim 13 under 35 U.S.C. § 103 as unpatentable over AAPA, Stresau, Kotani, and Packard;⁴ and
- D. Claim 16 under 35 U.S.C. § 103 as unpatentable over AAPA, Stresau, Kotani, Packard, and Muramatsu.⁵

Ans. 2; Final Act. 4–12.

OPINION

Rejection under 35 U.S.C. § 112(b)

Independent claim 11 is directed to a right-angle time-of-flight detector comprising, *inter alia*, “an electrostatic bender of secondary electron[s].” Appeal Br. 11 (Claim Appendix). It is undisputed that the ordinary meaning of this term is “a static electric field that can alter the trajectory of an electron.” Final Act. 4; Appeal Br. 5.

The Examiner states that Appellant uses this claim term to mean a magnet, and considers such use to be contrary to the ordinary meaning of “an electrostatic bender of secondary electron[s].” Final Act. 4. According to the Examiner, because Appellant is attempting to specifically define a term of a claim contrary to its ordinary meaning, “the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term.” Final Act. 4. The Examiner finds,

² Stresau et al., US 2004/0159796 A1, published Aug. 19, 2004.

³ Kotani et al., US 2012/0025085 A1, published Feb. 2, 2012.

⁴ Packard, US 5,656,807, issued Aug. 12, 1997.

⁵ Muramatsu, US 4,963,113, issued Oct. 16, 1990.

however, that the “the specification does not clearly redefine the term” to mean a magnet, and therefore concludes that the claim term is indefinite. Final Act. 4.

Appellant argues that a magnet does meet the plain meaning of “electrostatic bender of secondary electron[s],” because an electromagnet is one type of magnet, and can produce an electrostatic field. Reply 1–2.

We disagree with the Examiner’s determination that Appellant is acting as its own lexicographer to specifically define an “electrostatic bender of secondary electron[s]” contrary to the term’s ordinary meaning. *See* Final Act. 4, Ans. 3. First, as noted above, it is undisputed that the ordinary meaning of “electrostatic bender of secondary electron[s]” is “a static electric field that can alter the trajectory of an electron.” Final Act. 4; Appeal Br. 5. Second, the Examiner never explains adequately the basis for the conclusion that “a magnet does not meet the plain meaning of” an “electrostatic bender of secondary electron[s].” Final Act. 4, Ans. 3. Appellant, however, does explain the basis for its argument that an electromagnet meets the plain meaning of the claim term, namely that an electromagnet can produce an electrostatic field.⁶ Reply 1–2. Further, we agree with Appellant that a person of ordinary skill in the art would understand that the term “magnet” includes “electromagnets.” Reply 1. As a result, the preponderance of evidence does not support the Examiner’s determination that the claim term “electrostatic bender of secondary electron[s]” is indefinite because the Appellant attempted to define the term

⁶ Because the Examiner’s prior art rejections do not hinge on whether a magnet can create a static electric field that can alter the trajectory of an electron, we need not answer that question for the purpose of this appeal.

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contrary to its ordinary meaning and failed to clearly redefine the claim term in the Specification. Final Act. 4.

We, therefore, reverse the Examiner's rejection of claims 11, 12, and 14 under 35 U.S.C. § 112(b).

Rejections under 35 U.S.C. § 103

Claim 1 is directed to a time-of-flight detector comprising, *inter alia*, an electrode with a side window, a magnet with a magnetic field strength between 10 Gauss and 1000 Gauss for bending electron trajectories towards said side window, a scintillator located past the side window, and a photo-multiplier (PMT) located past the scintillator. *See* Appeal Br. 10 (Claim Appendix). In the Final Action, the Examiner finds that the AAPA discloses a time-of-flight detector having an electrode with a side window, and a detector located at the side window of the electrode. Final Act. 5. The Examiner finds that Stresau discloses an ion detector having a magnet for bending electron trajectories, and determines it would have been obvious to a person of ordinary skill in the art to use "whatever field strength was necessary for the required amount of bending." Final Act. 5-6. Additionally, the Examiner finds that "[i]t would also be obvious to place the detector past the window rather than within it to reduce the repulsive effect on the ions." Final Act. 6.

The Examiner next finds that Kotani discloses an ion detector including a scintillator and photo-multiplier (PMT), and concludes it would have been obvious to a person of ordinary skill in the art "to substitute the scintillator and PMT of Kotani et al. for the electron multiplier of the AAPA to increase the lifetime of the detector, as PMTs are well known to have long lifetimes." Final Act. 6.

In its Appeal Brief, Appellant argues that the Examiner failed to demonstrate the combined teachings of the AAPA, Stresau, and Kotani disclose or suggest including a scintillator past a side window of an electrode, in combination with the remaining elements of claim 1. Appeal Br. 6. Appellant notes that the Examiner's discussion of Stresau relates to placing a "detector" past a side window, not a "scintillator," and challenges the Examiner's purported reason for modifying the location of Stresau's detector, asserting that "the Examiner has failed to provide any prior art evidentiary support in the record for why a person of ordinary skill in the art would have been motivated to reduce the repulsive effect on the ions in the AAPA." Appeal Br. 6–8. Additionally, Appellant argues that Kotani discloses a scintillator located within an ion detector, which is the opposite of what claim 1 requires. Appeal Br. 7–8.

In the Answer, the Examiner responds to Appellant's arguments by stating:

the main prior art, AAPA, discloses a detector located just at the window, and when combined with Kotani et al. would have a scintillator in the same location. There does not appear to be any criticality to the location of the scintillator, except that it must be outside the electrode. It appears that a scintillator located at the side window and one located just past the side window would work identically. Unless appellant can show criticality, the difference is obvious.

Ans. 3.

In its Reply, Appellant argues that the Examiner has improperly relied on a "*per se* rule that lack of 'criticality' of a claimed location render[s] the location obvious," and failed to present a reason for modifying the AAPA to include a scintillator located past a side window of an electrode. Reply 2–3 (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417–418 (2007) for the

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proposition that “rejections on obviousness grounds cannot be sustained by mere conclusory statements”).

We are persuaded by Appellant’s arguments. The Examiner does not direct us to any prior art reference disclosing a detector or scintillator located past a side window of an electrode. Instead, as the Examiner acknowledges, the AAPA discloses a detector at the side window, and, as Appellant points out, Kotani discloses a scintillator inside the housing of an ion detector, as opposed to past a side window of an electrode. Final Act. 5–6; Appeal Br. 6–7.

Furthermore, we agree with Appellant that the Examiner fails to support adequately the conclusion that it would have been “obvious to place the detector past the window rather than within it to reduce the repulsive effect on the ions.” Final Act. 6. The Examiner does not direct us to evidence in the record demonstrating sufficiently what impact, if any, a detector or scintillator located within a window of an electrode would have on ions, and how, or whether, a person of ordinary skill in the art would have expected that moving the detector or scintillator past the window would affect the ions. We further note that this statement appears to be inconsistent with the Examiner’s conclusion in the Answer that the location of the detector/scintillator is not critical, and that “a scintillator located at the side window and one located just past the side window would work identically.” Ans. 3.

For all of the foregoing reasons, we find the Examiner has failed to provide the required “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418. We, therefore, reverse the Examiner’s rejections of independent claim 1, and claims 2–10, 13, 15, and 16, which depend from claim 1.

CONCLUSION

The Examiner's rejections of claims 1–16 are reversed.

DECISION SUMMARY

In summary:

| Claim(s) Rejected | 35 U.S.C. § | Reference(s)/Basis | Affirmed | Reversed |
|------------------------------|----------------------------|--|-----------------|-----------------|
| 11, 12, 14 | 112(b) | Indefiniteness | | 11, 12, 14 |
| 1–10, 15 | 103 | AAPA, Stresau, Kotani | | 1–10, 15 |
| 13 | 103 | AAPA, Stresau, Kotani, Packard | | 13 |
| 16 | 103 | AAPA, Stresau, Kotani, Packard, Muramatsu | | 16 |
| Overall Outcome | | | | 1–16 |

REVERSED