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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARK SELKER and BARBARA PALDUS¹

Appeal 2016-006549
Application 13/506,585²
Technology Center 2800

Before CATHERINE Q. TIMM, JEFFREY T. SMITH,
and MICHAEL G. McMANUS, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Non-Final Rejection of pending claims 1–14 and 16–42, which constitute all the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

¹ Mark Selker and Barbara Paldus are the named inventors of the present application.

² According to Appellants, the real party in interest is Finesse Solutions, Inc. *See* App. Br. 3.

Appellants' appealed invention relates to “[a]n analyzer system for determining the identity and concentration of at least one target analyte present in a liquid sample from a bioprocess utilizing anti-Stokes Raman optical scattering effect.” (Spec. 13). Representative claim 1 is reproduced from the Claims Appendix to the principal Brief:

1. An analyzer system for determining the identity and concentration of at least one target analyte present in a liquid sample from a bioprocess utilizing anti-Stokes Raman optical scattering effect, said analyzer system comprising:
 - i) a laser light source emitting light having a wavelength in the ultraviolet to near infrared spectral region which generates Raman anti-Stokes emissions when incident on said analyte;
 - ii) a hollow core photonic band-gap fiber optically connected to said light source, said fiber including a first inlet configured to permit introduction of an analyte containing the liquid sample from the bioprocess into the fiber;
 - iii) a plurality of reference calibrants comprising multiple analytes and/or multiple concentrations of analyte corresponding to an analyte in the sample;
 - iv) a second inlet permitting introduction of said calibrant into the fiber;
 - v) a spectral analysis system optically coupled to said fiber and configured to (i) detect and measure spontaneously scattered Raman-shifted anti-Stokes emission signals received from said fiber and to derive the Raman anti-Stokes spectral peaks and/or spectra of said calibrants and said target analyte present in the liquid sample, and to utilize the amplitudes of spontaneously scattered Raman-shifted anti-Stokes spectral peaks and/or spectra of the plurality of calibrants and the target analyte in univariate analysis to thereby quantitatively yield the concentration of the target analyte in the liquid sample, and (ii) use the spontaneously scattered Raman-shifted anti-Stokes spectral peaks and/or spectra of the plurality of calibrants to establish a baseline response of the analysis system to account

for cross sensitivities or spectral peak overlaps of analytes in the liquid sample; and

vi) an outlet for expelling the analyte and/or a plurality of calibrants from the fiber.

Appellants (*see generally* App. Br.) request review of the following rejections:

- I. Claims 1, 2, 5, 6, 9–11, 14, 16, 18, 26, 27, 30, 32, 34, 35, and 37-42 are rejected under 35 U.S.C. §103(a) obvious over Chen (US 2010/0007876) in view of Ozaki (US 5,870,188) in view of Ramasubramanyan (US 2012/0123688) and in view of Petricoin (US 2010/0203549).
- II. Claims 22–25 are rejected under 35 U.S.C. §103(a) obvious over Chen in view of Ozaki and Ramasubramanyan and Petricoin and further in view of Selker (US 2012/0244609).
- III. Claims 3, 4, and 33 are rejected under 35 U.S.C. §103(a) obvious over Chen in view of Ozaki and Ramasubramanyan and Petricoin and further in view of Loebig (US 2011/0299065).
- IV. Claims 7, 8, and 21 are rejected under 35 U.S.C. §103(a) as obvious over Chen in view of Ozaki and Ramasubramanyan and Petricoin and further in view of Toumbas (US 2012/0135405).
- V. Claims 12, 13, 17, 19, 20, 29, and 36 are rejected under 35 U.S.C. §103(a) as obvious over Chen in view of Ozaki and Ramasubramanyan and Petricoin and further in view of Roberts (US 2011/0267612).
- VI. Claim 28 is rejected under 35 U.S.C. §103(a) as obvious over Chen in view of Ozaki and Ramasubramanyan and Petricoin and further in view of Taru (US 2009/0252452).
- VII. Claim 31 is rejected under 35 U.S.C. §103(a) as obvious over Chen in view of Ozaki and Ramasubramanyan and Petricoin and further in view of Zeng (US 2003/0231305).

OPINION³

After consideration of the evidence in this appeal record in light of the respective positions advanced by the Examiner and Appellants, we determine Appellants have identified reversible error in the appealed rejections.

Claims 1 and 18

The Examiner erred in the determination that Smith teaches a second cover that is “movable from a first position where the second cover is removably attached to and covers a portion of the container to a second position where the second cover no longer covers the portion of the container” as required by independent claims 1 and 18.⁴

The Examiner found Chen teaches an analyzer system for determining the identity and concentration of at least one target analyte present in a liquid. The Examiner found Chen discloses all the features of the claimed invention except: (1) a system utilizing anti-Stokes Raman optical scattering effect (2) a plurality of reference calibrants comprising multiple analytes corresponding to an analyte in the sample; (3) a second inlet permitting introduction of said calibrant into the fiber; (4) receiving spontaneously scattered Raman-shifted anti-Stokes emission signals; and (5) using the spontaneously scattered Raman-shifted anti-Stokes spectral peaks and/or spectra of the plurality of calibrants to establish a baseline response of the analysis system to account for cross sensitivities or spectral peak overlaps of analytes in the liquid sample. (Non-Final Act. 4). For these differences the

³ We limit our discussion to independent claims 1 and 18.

⁴ The complete statement of the rejections on appeal appears in the Non-Final Office Action. (Non-Final Act. 3–23).

Examiner relies on Ozaki for teaching anti-Stokes Raman optical scattering effect and both Ramasubramanyan and Petricoin for teaching a plurality of calibrants. The Examiner determined it was obvious matter of design choice to use second inlet. (Non Final Act. 4–7).

Appellants argue the Examiner does not explain how Ozaki’s Raman anti-Stokes detection system could be combined with Chen’s system. Appellants argue Ozaki’s system utilizes “a flow cell used to reflect an incident beam multiple times to generate anti-Stokes scattering thus, the combination of Chen and Ozaki is not physically or logically appropriate. (App. Br. 22–23).

We agree with Appellants that the Examiner’s rejection of independent claims 1 and 18 is not well-founded. Appellants argue Ozaki detects anti-Stokes signals by utilizing multiple reflections produced using a free-space capture mechanism which is not interchangeable with Chen’s hollow-core wave-guiding mechanism. (App. Br. 22–23; Reply Br. 2–3). We agree with Appellants that the Chen system involves detecting primarily homonuclear diatomic molecules by transmitting light from a light source through a hollow-core wave-guiding device, introducing a gaseous medium between the light source and the hollow-core wave-guiding device, and detecting molecules within the gas. (*See* Chen Figure 4). On the other hand the Ozaki system is a free-space optical system that requires the use of a sphere-type cell holder to generate multiple reflected beams to provide anti-Stokes signal of sufficient magnitude for detection and measurement. (*See* Ozaki Col. 11, Fig. 8). These two systems are entirely different and not interchangeable with each other. (Reply Br. 4–5).

The Examiner has not directed us to an adequate basis for combining the teachings of Chen and Ozaki as proposed. Accordingly, we reverse the rejection of independent claims 1 and 18.⁵

Accordingly, for the foregoing reasons we reverse the Examiner's decision to reject claims 1–14 and 16–42.

DECISION

The Appealed rejections of claims 1–14 and 16–42 are reversed.

REVERSED

⁵ The additional reference relied upon by the Examiner in the obviousness rejections were cited to address limitations of the dependent claims that are not related to our discussion of the independent claims.