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Gulati et al.

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(54) **SYSTEMS AND METHODS FOR GENERATING AND USING PROJECTOR CURVE SETS FOR UNIVERSAL CALIBRATION FOR NONINVASIVE BLOOD GLUCOSE AND OTHER MEASUREMENTS**

(56) **References Cited**

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(71) Applicant: **Zyomed Corp.**, Altadena, CA (US)
(72) Inventors: **Sandeep Gulati**, La Canada Flintridge, CA (US); **Timothy L. Ruchti**, Gurnee, IL (US); **William Van Antwerp**, Valencia, CA (US); **John L. Smith**, Portland, OR (US)

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(73) Assignee: **Zyomed, Corp.**, Altadena, CA (US)
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Primary Examiner — Kiho Kim

(74) Attorney, Agent, or Firm — Goodwin Procter LLP

(57) **ABSTRACT**

A synthetic projection system determines analyte concentration, such as blood glucose concentration, from a spectral-energy change associated with an uncharacterized instance of a medium in which the analyte is likely present. The projection system is factory calibrated for different instances of the medium, without needing instance-specific training or calibration. The projection system includes a set of projector curves, each relating spectral-energy change values obtained by analyzing reference medium samples to analyte concentrations in those samples. Each projector curve also corresponds to a respective range of energy-change gradients, determined using a group of surrogate media characterized according to analyte concentrations measured using a reference system. A spectral-energy-change gradient for the uncharacterized medium may be computed to select one of the projectors curves. Analyte concentration in the uncharacterized medium can be reliably computed at a specified high level of accuracy using the spectral-energy change associated therewith and the selected curve.

Related U.S. Application Data

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CPC **G01N 21/3577** (2013.01); **A61B 5/0075** (2013.01); **A61B 5/024** (2013.01);

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(58) **Field of Classification Search**
CPC G01N 21/93

See application file for complete search history.

18 Claims, 207 Drawing Sheets

