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(54) **MICROFLUIDIC DEVICE HAVING AN IMMOBILIZED PH GRADIENT AND PAGE GELS FOR PROTEIN SEPARATION AND ANALYSIS**

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See application file for complete search history.

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(60) Provisional application No. 60/962,663, filed on Jul. 30, 2007.

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(57) **ABSTRACT**

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Disclosed is a novel microfluidic device enabling on-chip implementation of a two-dimensional separation methodology. Previously disclosed microscale immobilized pH gradients (IPG) are combined with perpendicular polyacrylamide gel electrophoresis (PAGE) microchannels to achieve orthogonal separations of biological samples. Device modifications enable inclusion of sodium dodecyl sulfate (SDS) in the second dimension. The device can be fabricated to use either continuous IPG gels, or the microscale isoelectric fractionation membranes we have also previously disclosed, for the first dimension. The invention represents the first all-gel two-dimensional separation microdevice, with significantly higher resolution power over existing devices.

(58) **Field of Classification Search**
CPC G01N 27/44773; G01N 27/44778; G01N 27/44791; G01N 27/44795; G01N

15 Claims, 15 Drawing Sheets

