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*Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.*

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**United States Patent**

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US009546988B2

(12) **United States Patent**  
**Yu**(10) **Patent No.:** **US 9,546,988 B2**  
(45) **Date of Patent:** **Jan. 17, 2017**(54) **PULSED ION MULTIFUNCTIONAL  
DETECTOR FOR BOTH HIGH  
PERFORMANCE LIQUID  
CHROMATOGRAPH AND ION  
CHROMATOGRAPH**(52) **U.S. CL.**  
CPC ..... *G01N 30/64* (2013.01); *G01N 30/96*  
(2013.01); *G01N 2030/626* (2013.01)(58) **Field of Classification Search**  
None  
See application file for complete search history.(71) Applicants: **Jiade Yu**, Shanghai (CN); **Chingchuen Chan**, Hong Kong (CN); **Qing Lu**, Wuhan, Hubei Province (CN)*Primary Examiner* — Laura Martin  
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*G01N 30/96* (2006.01)  
*G01N 30/64* (2006.01)  
*G01N 30/62* (2006.01)(57) **ABSTRACT**

A pulsed ion multifunctional detector used for both high performance liquid chromatograph and ion chromatograph, and experiment chromatograms attached also show that the detector has excellent multipurpose function in liquid chromatograph. The casing of the instrument is provided with a sample solution inlet, a sample solution outlet, a power supply socket, a liquid crystal display, an operation keyboard and a detection signal output interface. In the casing is provided a detection electromechanical member, which includes a central controller, a detection cell, a proposed subtracting module, a polarity transformation module, a noise processing module and an output amplifier module. The pulsed ion multifunctional detector can sensitively and accurately measure ion current of sample ionized directly in the detection cell, and subtract baseline background generated by various mobile phases and automatically eliminate dynamic noise and drift of the instrument.

**8 Claims, 7 Drawing Sheets**