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(12) **United States Patent**
Jones

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(54) **SELF-SHIELDING FLEX-CIRCUIT DRIFT TUBE, DRIFT TUBE ASSEMBLY AND METHOD OF MAKING**

(58) **Field of Classification Search**
USPC 250/281, 282, 283, 290, 291, 292, 293, 250/294, 295, 296, 297, 298, 299
See application file for complete search history.

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(56) **References Cited**

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(57) **ABSTRACT**

Related U.S. Application Data

The present disclosure is directed to an ion mobility drift tube fabricated using flex-circuit technology in which every other drift electrode is on a different layer of the flex-circuit and each drift electrode partially overlaps the adjacent electrodes on the other layer. This results in a self-shielding effect where the drift electrodes themselves shield the interior of the drift tube from unwanted electro-magnetic noise. In addition, this drift tube can be manufactured with an integral flex-heater for temperature control. This design will significantly improve the noise immunity, size, weight, and power requirements of hand-held ion mobility systems such as those used for explosive detection.

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H01J 49/40 (2006.01)
H01J 49/06 (2006.01)
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(52) **U.S. Cl.**
CPC **H01J 49/062** (2013.01); **G01N 27/622** (2013.01); **H01J 49/0022** (2013.01)

18 Claims, 12 Drawing Sheets

