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[54] **PROCESS AND APPARATUS FOR CHANGING THE ENERGY OF CHARGED PARTICLES CONTAINED IN A GASEOUS MEDIUM**

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[52] **U.S. Cl.** **250/288**; 328/233

[58] **Field of Search** ..... 250/288, 289, 423 R, 250/423 F, 424, 425; 313/359.1, 360.1, 361.1, 362.1; 328/233

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[57] **ABSTRACT**

A method of changing the energy of charged particles contained in a gas comprises allowing the gas to flow into a region of reduced pressure through a tube like member so that viscous forces exerted on the charged particles by the flowing gas molecules determine the kinetic energy of the charged particles. A potential gradient is maintained along the length of the tube so that the potential energy of the charged particles is changed as they pass through the tube. At the end of the tube a free jet expansion occurs so that the kinetic energy of the charged particles is no longer determined by the flowing gas, so that they can be accelerated to any desired kinetic energy by means of another potential gradient.

The invention can be used to interface any high pressure ion source to a magnetic sector mass spectrometer, or to permit the operation of an electrospray ion source with an earthed inlet capillary with either a quadrupole or a magnetic sector mass spectrometer.

38 Claims, 4 Drawing Figures