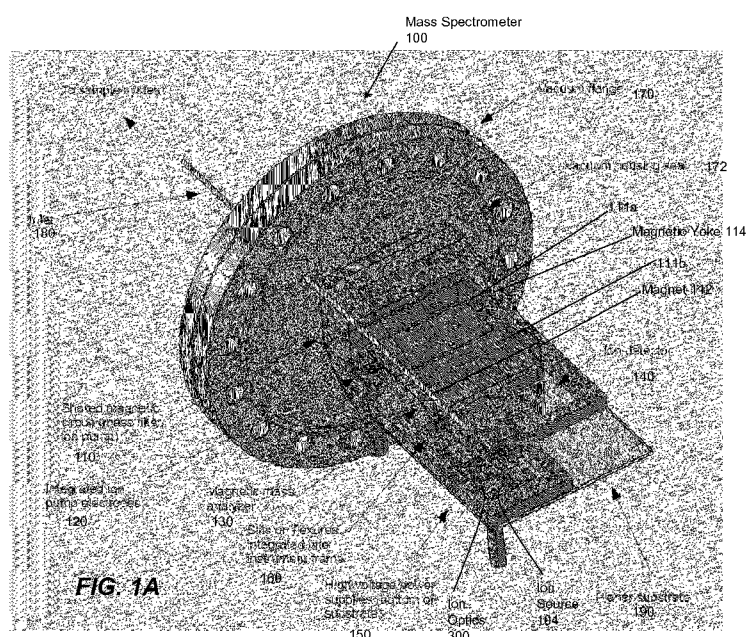




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[Continued on next page]

(54) **Title:** METHODS, APPARATUS, AND SYSTEM FOR MASS SPECTROMETRY

(57) **Abstract:** A miniature, low cost mass spectrometer capable of unit resolution over a mass range of 10 to 50 AMU. The mass spectrometer incorporates several features that enhance the performance of the design over comparable instruments. An efficient ion source enables relatively low power consumption without sacrificing measurement resolution. Variable geometry mechanical filters allow for variable resolution. An onboard ion pump removes the need for an external pumping source. A magnet and magnetic yoke produce magnetic field regions with different flux densities to run the ion pump and a magnetic sector mass analyzer. An onboard digital controller and power conversion circuit inside the vacuum chamber allows a large degree of flexibility over the operation of the mass spectrometer while eliminating the need for high-voltage electrical feedthroughs. The miniature mass spectrometer senses fractions of a percentage of inlet gas and returns mass spectra data to a computer.

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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