



TITLE : METHOD AND APPARATUS FOR ION BEAM FORMATION IN AN ION IMPLANTER

ABSTRACT

A low energy ion implanter (10) having an ion source (12) for emitting ions (14) and an implantation chamber (17) spaced from the ion source by an ion beam path through which ions move from the source to the implantation chamber. A mass analyzing magnet (22) positioned along the beam path between the source and the implantation chamber deflects ions through controlled arcuate paths to filter ions from the beam while allowing certain other ions to enter the ion implantation chamber. The magnet includes multiple magnet pole pieces (110, 112) constructed from a ferromagnetic material and having inwardly facing pole surfaces (114, 116) that bound at least a portion of an ion deflection region (120). One or more current carrying coils (122, 123) set up dipole magnetic fields (B0) in the deflection region near the pole pieces. Additional coils (130, 131, 132, 133, 134, 135, 136, 137) help set up a quadrapole field (Q1, Q2, Q3, Q4) in deflection region. A controller (100) electrically coupled to the one or more coils of said magnet controls current through the one or more current carrying coils to create the magnetic field in the deflection region near the pole pieces.

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