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(54) Title: ION IMPLANTATION SYSTEM AND METHOD

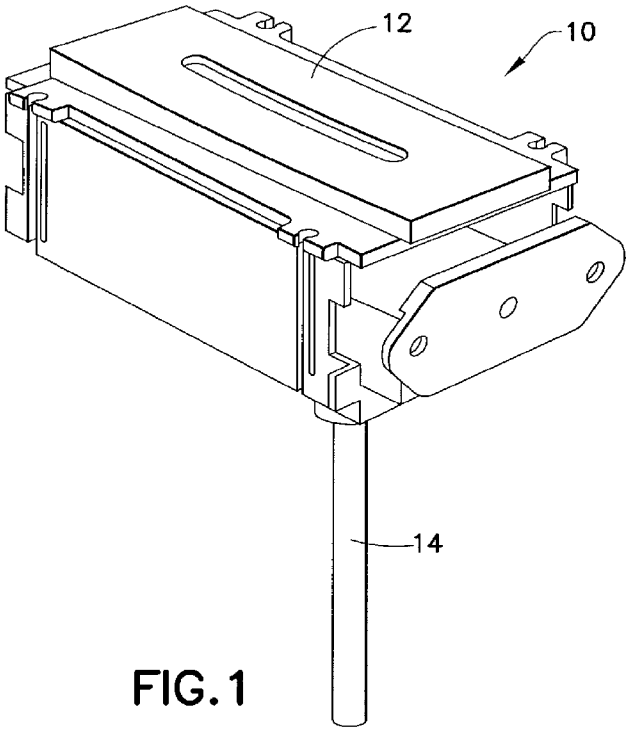


FIG. 1

(57) Abstract: An ion implantation system and method, providing cooling of dopant gas in the dopant gas feed line, to combat heating and decomposition of the dopant gas by arc chamber heat generation, e.g., using boron source materials such as B2F4 or other alternatives to BF3. Various arc chamber thermal management arrangements are described, as well as modification of plasma properties, specific flow arrangements, cleaning processes, power management, eqillibrium shifting, optimization of extraction optics, detection of deposits in flow passages, and source life optimization, to achieve efficient operation of the ion implantation system.

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