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(54) Title: MAGNETIC IMMERSION ELECTRON GUN

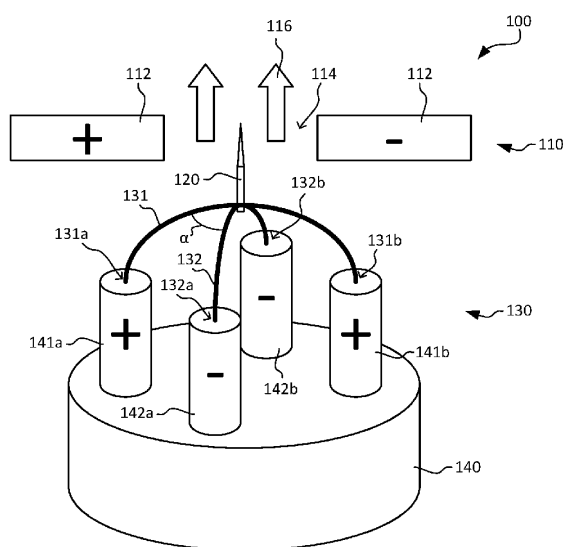


FIG. 1A

(57) Abstract: The present disclosure provides a magnetic immersion electron gun and a method of generating an electron beam using a magnetic immersion electron gun. The electron gun includes a magnetic lens forming a magnetic field, a cathode tip disposed in the magnetic field, and a multi-filament heater configured to directly heat the cathode tip to emit electrons through the magnetic lens. The multi-filament heater includes a first filament connected at each end to first and second positive terminals of a power source and a second filament connected at each end to first and second negative terminals of the power source. The first positive terminal, the second positive terminal, the first negative terminal, and the second negative terminal are arranged alternately around the cathode tip such that the first filament and the second filament intersect at the cathode tip and a resultant magnetic force applied to the cathode tip is reduced.

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