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(71) Applicant: HEWLETT-PACKARD COMPANY [US/US]; 3000 Hanover Street, Palo Alto, CA 94304-1112 (US).

(72) Inventors: CHEN, Zhizhang; 4411 Snowbrush Dr., Corvallis, OR 97330 (US). BICE, Michael, David; 6257 SW Trellis Dr., Corvallis, OR 97330 (US). ENCK, Ronald, L.; 1970 NE Conifer Blvd., Corvallis, OR 97330 (US). REGAN, Michael, J.; 3210 NW Arrowood Circle, Corvallis, OR 97330 (US). NOVET, Thomas; 2905 NW Ashwood Drive, Corvallis, OR 97330 (US). BENNING, Paul, J.; 4736 NW Jeanice Pl., Corvallis, OR 97330 (US).

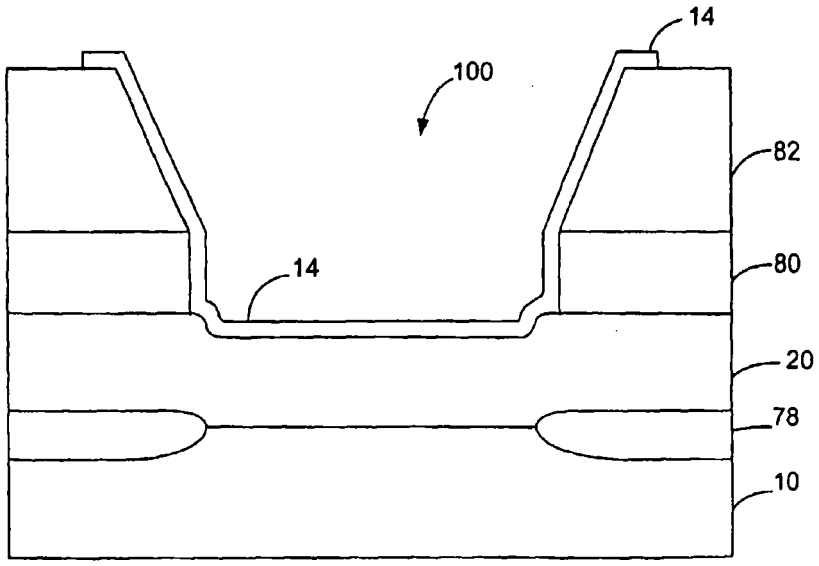
(74) Agent: MYERS, Timothy, F.; Hewlett-Packard Company, Intellectual Property Administration, 3404 E. Harmony Road, m/s 35, Fort Collins, CO 80525-9599 (US).

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[Continued on next page]

(54) Title: SILICON-BASED DIELECTRIC TUNNELING EMITTER



(57) Abstract: An emitter (50, 100) has an electron supply layer (10) and a silicon-based dielectric layer (20) formed on the electron supply layer (10). The silicon-based dielectric layer (20) is preferably less than about 500 Angstroms. Optionally, an insulator layer (78) is formed on the electron supply layer (10) and has openings defined within in which the silicon-based dielectric layer (20) is formed. A cathode layer (14) is formed on the silicon-based dielectric layer (20) to provide a surface for energy emissions (22) of electrons (16) and/or photons (18). Preferably, the emitter (50,100) is subjected to an annealing process (120,122) thereby increasing the supply of electrons (16) tunneled from the electron supply layer (10) to the cathode layer (14).

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