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Meyer et al.(10) **Pub. No.: US 2023/0231364 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **WEAK INDEX GUIDING OF INTERBAND
CASCADE LASERS****Related U.S. Application Data**

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(71) Applicant: **The Government of the United States of America, as represented by the Secretary of the Navy, Arlington, VA (US)****Publication Classification**(72) Inventors: **Jerry R. Meyer**, Catonsville, MD (US); **Alexander Spott**, Santa Barbara, CA (US); **Chul Soo Kim**, West Springfield, VA (US); **Mijin Kim**, West Springfield, VA (US); **Chadwick L. Canedy**, Washington, DC (US); **Charles D. Merritt**, Fairfax, VA (US); **William W. Bewley**, Falls Church, VA (US); **Igor Vurgaftman**, Severna Park, MD (US)(51) **Int. Cl.**
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CPC **H01S 5/3419** (2013.01); **H01S 5/3422** (2013.01)(73) Assignee: **The Government of the United States of America, as represented by the Secretary of the Navy, Arlington, VA (US)**(57) **ABSTRACT**(21) Appl. No.: **18/149,778**(22) Filed: **Jan. 4, 2023**

Semiconductor laser architectures that provide weak index guiding of interband cascade lasers (ICLs) processed on a native III-V substrate and of ICLs grown on silicon or integrated on silicon by heterogeneous bonding. Weak index guiding of a ridge waveguide semiconductor laser can enhance the stability of lasing in the fundamental lateral mode, so as to allow a wider ridge to maintain stable single-lateral-mode operation.

