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(54) **ARTIFICIAL BAND GAP**

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(65) **Prior Publication Data**

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Related U.S. Application Data

Sungtaek Ju et al., "Study of interface effects in thermoelectric microrefrigerators", Journal of Applied Physics, Oct. 1, 2000, pp. 4135-4139, vol. 88, No. 7.

(60) Division of application No. 10/760,697, filed on Jan. 19, 2004, now Pat. No. 7,166,786, which is a division of application No. 09/634,615, filed on Aug. 5, 2000, now Pat. No. 6,680,214, and a continuation of application No. 09/093,652, filed on Jun. 8, 1998, now abandoned.

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(51) **Int. Cl.**
H01L 29/06 (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.** **257/9**; 977/755; 977/781
(58) **Field of Classification Search** ... 257/9; 372/46.01;
977/755, 781

A method is disclosed for the induction of a suitable band gap and electron emissive properties into a substance, in which the substrate is provided with a surface structure corresponding to the interference of electron waves. Lithographic or similar techniques are used, either directly onto a metal mounted on the substrate, or onto a mold which then is used to impress the metal. In a preferred embodiment, a trench or series of nano-sized trenches are formed in the metal.

See application file for complete search history.

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17 Claims, 7 Drawing Sheets

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