

Title (en)  
Cold cathode electron-emitting device

Title (de)  
Elektronenemittierende Vorrichtung mit Kaltkathode

Title (fr)  
Dispositif d'émission d'électrons à cathode froide

Publication  
**EP 0959485 A1 19991124 (EN)**

Application  
**EP 98870112 A 19980518**

Priority  
EP 98870112 A 19980518

Abstract (en)  
A cold cathode electron-emitting device (1) comprises a Schottky junction (6) between a thin n-type semiconductor layer (5) and a metal electrode (4), and is exposed to a vacuum. A voltage which is positive with respect to the metal electrode (4) is applied to the n-type semiconductor layer (5) so that the Schottky junction (6) becomes reverse biased to a degree that electrons are injected from the metal electrode (4) into the conduction band of the n-type semiconductor layer (5) by tunnelling. After having travelled through the n-type semiconductor layer (5), a part of the electrons still have enough energy to bridge the electron affinity of the n-type semiconductor layer (5) and are injected into the vacuum. The electron affinity, band gap, thickness and impurity concentration of the n-type semiconductor layer (5) are important parameters for the electron emission to be efficient.  
<IMAGE>

IPC 1-7  
**H01J 1/30**

IPC 8 full level  
**H01J 1/308** (2006.01)

CPC (source: EP)  
**H01J 1/308** (2013.01)

Citation (search report)

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