

Abstract

MICRON-GAP THERMAL PHOTOVOLTAIC LARGE SCALE SUB-MICRON GAP METHOD AND APPARATUS

The present invention relates to micron-gap thermal photovoltaic (MTPV) technology for the solid-state conversion of heat to electricity. The problem is forming and then maintaining the close spacing between two bodies at a sub-micron gap in order to maintain enhanced performance. While it is possible to obtain the sub-micron gap spacing, the thermal effects on the hot and cold surfaces induce cupping, warping, or deformation of the elements resulting in variations in gap spacing thereby resulting in uncontrollable variances in the power output. A major aspect of the design is to allow for intimate contact of the emitter chips to the shell inside surface, so that there is good heat transfer. The photovoltaic cells are pushed outward against the emitter chips in order to press them against the inner wall. A high temperature thermal interface material improves the heat transfer between the shell inner surface and the emitter chip.

Fig. 1