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(54) Title: THERMAL BARRIER COATING CERAMIC STRUCTURE			
(57) Abstract			
A multilayered ceramic topcoat of a thermal barrier coating system is useful for high temperature corrosive applications such as hot section components in gas turbine engines. The ceramic topcoat includes at least two layers, each having generally columnar grain microstructures with different grain orientation directions. A preferred method of producing the multilayered ceramic topcoat includes positioning a superalloy substrate at a first angled orientation relative to a ceramic vapor cloud in an electron beam physical vapor deposition apparatus for a time sufficient to grow a first ceramic layer. The substrate is then reoriented to a second, different angled orientation for a time sufficient to grow a second ceramic layer. The ceramic layers exhibit columnar microstructures having respective grain orientation directions which are related to the first and second substrate orientations. For uniformly coating a complex contoured surface such as a turbine blade airfoil, the blade can be rotated during coating deposition at each angled orientation. Alternatively, the article may be continuously reoriented according to a predetermined speed cycle to produce generally arcuate, sinusoidal, helical, or other columnar grain microstructures.			