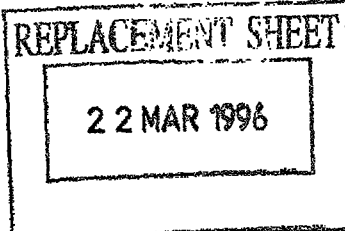




22 MAR 1996

Claims:

1. A method of producing a coating on a substrate which comprises depositing by electrolytic deposition a metal matrix M_1 from a bath containing particles of $CrAlM_2$ so as to co-deposit the particles with the matrix, wherein M_1 is at least one element selected from the group consisting of Ni, Co, and Fe and M_2 is at least one element selected from the group consisting of Y, Si, Ti, Hf, Ta, Nb, Mn, Pt and rare earth elements, said deposition being carried out at a current density of less than 3 mA per square centimetre.
2. A method of producing a coating on a substrate which comprises depositing by electrolytic deposition a metal matrix M_1 from a bath containing particles of $CrAlM_2$ so as to co-deposit the particles with the matrix in the form of a layer wherein M_1 is at least one element selected from the group consisting of Ni, Co, and Fe and M_2 is at least one element selected from the group consisting of Y, Si, Ti, Hf, Ta, Nb, Mn, Pt and rare earth elements, said deposition being carried out at a current density of less than 5 mA per square centimetre, the layer being less than 50 μ m thick.
3. A method of producing a coating on a substrate which comprises depositing by electrolytic deposition a metal matrix M_1 from a bath containing particles of $CrAlM_2$ so as to co-deposit the particles with the matrix, wherein M_1 is at least one element selected from the group consisting of Ni, Co, and Fe and M_2 is at least one element selected from the group consisting of Y, Si, Ti, Hf, Ta, Nb, Mn, Pt and rare earth elements, said deposition being carried out at a current density of less than 5 mA per square



centimetre, and at a bath loading of less than 40 g/l of the particles.

5 4. A method as claimed in any one of the preceding claims in which the particles in said bath comprise <15 μ m powder.

10 5. A method as claimed in any one of the preceding claims in which either a single or double layer of particles is deposited during co-deposition of the metal matrix and particles.

15 6. A method as claimed in any one of the preceding claims which further includes aluminising, chromising or siliconising the co-deposited material.

20 7. A method as claimed in claim 6 which further includes plating a 5 to 10 μ m thick layer of platinum on top of said co-deposited material.

25 8. A method as claimed in any one of the preceding claims which comprises co-depositing a substantially 15 μ m thick layer of said metal matrix and said particles on to the substrate, aluminising, chromising or siliconising said co-deposited material, and heat treatment; wherein if said heat treatment occurs before said aluminising, chromising or siliconising, said treatment comprises subjecting said co-deposited material to between 1,000 and 1,100°C for approximately one hour under vacuum, and
30 wherein if said heat treatment occurs after said aluminising, chromising or siliconising, said treatment comprises subjecting said co-deposited material to about 1,100°C for approximately one hour under vacuum conditions, the thickness of coating material on the



substrate after said heat treatment being less than 75 μm .

5 9. A method as claimed in any one of the preceding claims which further includes depositing a thermal barrier layer, as a final layer, subsequent to said co-deposition.

10 10. The method as claimed in any one of the preceding claims wherein the substrate is selected from the group consisting of a gas turbine shaft, ring, disk, combustion can ware, stator blade, rotor blade, guide vane, gas turbine blade aerofoil section, gas turbine blade root portion and gas turbine blade shroud portion.

