



TECHNOLOGY AVAILABLE FOR LICENSING

Vibratory Powder Consolidation (VPC)

Patent Application Number PCT/US2008/001259, filed January 30, 2008

Inventors: Teiichi Ando, Ibrahim Endre Gunduz, Peter Y. Wong and Charalabos C. Doumanidis

Details About the Invention:

The invention is a method to fully consolidate metal powder mixtures at temperatures significantly lower than any other process available. Residual porosity is eliminated, which allows for greater strength and more uniform properties. Prior methods to accomplish this, such as sintering, required exposure to high temperatures which caused structural degradation, and can fail to achieve full-density consolidation. Similarly, shock waves also failed, because wave attenuation caused non-uniformity or insufficient consolidation.

The method of the invention subjects powder material under simultaneous static compressive loading and tangential ultrasonic vibratory energy. Full density consolidation of the powder is achieved within times as short as one second, and at temperatures much lower than the normal melting point. The method of the invention can be practiced using a sonotrode system at 1-120 kHz frequency, at 1-100 micron amplitude, for a duration of 0.01 to 10 seconds, with optional heating between a third to two thirds of the melting point of the lowest melting powder component.

Benefits of the Invention:

This method is well suited for small functional devices and composites. The method creates objects with tailored functionality, including mechanical, magnetic, optical, chemical, and thermal properties.

The Bottom Line:

The invention provides a method to convert powders to solid metal objects, which can be made with custom desired properties.

For More Information:

Please contact:

Anthony N. Pirri, PhD
Division of Technology Transfer
Northeastern University
360 Huntington Ave, 960 RP
Boston, MA 02115-5000
Phone: 617-373-8810
Fax: 617-373-8866
Email: a.pirri@neu.edu

or

Teiichi Ando
Dept. of Mechanical & Industrial Engineering
Northeastern University
360 Huntington Avenue, 334 Snell
Boston, MA 02115-5000
Phone: 617-373-3811
Email: tando@coe.neu.edu