

ABSTRACT

SYSTEMS AND METHODS FOR ADDITIVE MANUFACTURING UTILIZING LOCALIZED ULTRASOUND-ENHANCED MATERIAL FLOW AND FUSIONING

Ultrasonic filament modeling systems and methods may be utilized to achieve room-temperature 3-D printing of solid (> 95%) metal materials. A vibrating tool is applied to a metal filament to form a voxel, inducing mechanical deformation as well as inter-and intra-layer mass transport. Desired structures may be built on a voxel-by-voxel basis. Additionally, by varying the applied ultrasonic energy, the microstructure of the resulting structure may be controlled.

FIG. 2A