

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202311063489 A

(19) INDIA

(22) Date of filing of Application :21/09/2023

(43) Publication Date : 13/10/2023

(54) Title of the invention : SYSTEM AND METHOD FOR DIGITAL FABRICATION OF GRADED HIERARCHICAL MATERIAL STRUCTURES

(51) International classification :B33Y0010000000, B29C0064112000, B33Y0030000000, B29C0064209000, B33Y0070000000

(86) International Application No :NA
Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA
Filing Date :NA

(62) Divisional to Application Number :NA
Filing Date :NA

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(57) Abstract :

The present invention discloses a system (100) and method (200) for digital fabrication of graded hierarchical material structures. The system (100) includes a processor (102) for designing a three-dimensional model of the material structure, receiving specifications for material composition and properties, and applying the material using a fabrication tool. The fabrication tool may include multiple dispensers for different materials, enabling the creation of multi-layered structures. The processor (102) adjusts deposition parameters and incorporates simulation capabilities to optimize material properties and design parameters. The system allows for the integration of various materials such as polymers, metals, and ceramics. By enabling precise control and customization of material structures, this invention opens up new possibilities in diverse industries requiring tailored material properties and hierarchical designs.

No. of Pages : 22 No. of Claims : 10