

Abstract of the Disclosure

5 A method and apparatus for selectively sintering a layer of powder to produce a part comprising a plurality of sintered layers. The apparatus includes a computer controlling a laser to direct the laser energy onto the powder to produce a sintered mass. The computer either determines or is programmed with the boundaries of the desired cross-sectional regions of
10 the part. For each cross-section, the aim of the laser beam is scanned over a layer of powder and the beam is switched on to sinter only the powder within the boundaries of the cross-section. Powder is applied and successive layers sintered until a completed part is formed. Preferably, the powder
15 comprises a plurality of materials having different dissociation or bonding temperatures. The powder preferably comprises blended or coated materials, including precursor materials which are formed into a mass at the irradiated locations, and which either react due to the laser thermal
20 energy or in a later heat treatment to form a compound with properties different than the precursors. Examples are disclosed wherein a compound is formed which has a significantly higher melting point than that of one or more of the precursor powders.

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