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**(54) Title (EN):** A MACHINE AND A METHOD FOR ADDITIVE MANUFACTURING OF THREE-DIMENSIONAL OBJECTS

**(54) Title (FR):** MACHINE ET PROCÉDÉ DE FABRICATION ADDITIVE D'OBJETS TRIDIMENSIONNELS

**(57) Abstract:**

**(EN):** The disclosed invention resolves the problem of manufacturing three-dimensional objects by stacking two-dimensional layers of material in the third direction z. Described are a machine and a method for additive manufacturing of three-dimensional objects in which a predetermined final object is fabricated using the steps of the printing process (100) of individual curved three-dimensional print volumes (1, 2, 3...Z) in a sequence (51). Powdered material (102) is melted in a melting volume (280) which is inside an intersection volume (28) and in which the energy exerted by at least two particle clusters (160,170) emitted from at least two spatially positioned sources (11, 12) of particles with mass adds up and exceeds the threshold required for melting of the powdered material. Machine and method according to the disclosed invention enable the fabrication in multiple different printing directions simultaneously.

**(FR):** La présente invention résout le problème de la fabrication d'objets tridimensionnels par empilement de couches bidimensionnelles de matériau dans la troisième direction z. L'invention concerne donc une machine et un procédé de fabrication additive d'objets tridimensionnels grâce auxquels un objet final prédéterminé est fabriqué selon les étapes d'un procédé d'impression (100) de volumes d'impression tridimensionnels incurvés individuels (1, 2, 3...Z) dans une séquence (51). Un matériau pulvérulent (102) est fondu dans un volume de fusion (280) qui est à l'intérieur d'un volume d'intersection (28) et dans lequel l'énergie exercée par au moins deux agrégats de particules (160, 170) émis à partir d'au moins deux sources (11, 12) de particules positionnées spatialement avec une masse s'additionne et dépasse le seuil requis pour la fusion du matériau pulvérulent. La machine et le procédé de la présente invention permettent une fabrication simultanée dans de multiples directions d'impression différentes.

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### **Declarations:**

Declaration made as to the identity of the inventor (PCT Rules 4.17(i) and 51bis.1(a)(i))

Declaration made as applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate

Declaration made as applicant's entitlement, as at the international filing date, to claim the priority of the earlier application, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii))

Declaration of inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America