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(54) Title (EN): FLUIDIC SELF-ASSEMBLY FOR SYSTEM INTEGRATION

(54) Title (FR): AUTO-ASSEMBLAGE FLUIDE POUR INTÉGRATION DE SYSTÈME

(57) Abstract:

(EN): A method for self-assembly is disclosed that accomplishes the assembly process in one step, obviating or mitigating the need for post-processing of an assembled macro- electronic device. Microcomponents are fabricated having a particular shape, and a template with embedded interconnects is fabricated having recessed binding sites that are sized to receive particular microcomponent types. The binding sites include a low melting point alloy for electrically connecting received microcomponents to the interconnect network. The template is placed in a liquid, and the microcomponents are introduced to the liquid such that the microcomponents flow or slide along the template propelled by gravity and/or fluid-dynamic forces and some of them are received into the binding sites, and retained by capillary forces. The liquid is heated before or after introduction of the microcomponents to melt the alloy. The fluid and/or template are then cooled to harden the alloy, binding the microcomponents.

(FR): La présente invention concerne un procédé d'auto-assemblage qui accomplit le procédé d'assemblage en une étape, en évitant ou atténuant la nécessité d'un post-traitement d'un dispositif macroélectronique assemblé. Des microcomposants sont fabriqués, lesquels ont une forme particulière, et un modèle avec des interconnexions noyées est fabriqué, lequel comporte des sites de liaison en retrait qui sont dimensionnés afin de recevoir des types de microcomposants particuliers. Les sites de liaison incluent un alliage à bas point de fusion afin de connecter électriquement des microcomposants reçus au réseau d'interconnexions. Le modèle est placé dans un liquide, et les microcomposants sont introduits dans le liquide de telle manière à ce que les microcomposants s'écoulent ou glissent le long du modèle propulsés par la gravité et/ou des forces à dynamique de fluide et certains d'entre eux sont reçus dans des sites de liaison, et retenus par des forces capillaires. Le liquide est chauffé avant ou après l'introduction des microcomposants pour faire fondre l'alliage. Le fluide et/ou le modèle sont ensuite refroidis afin de durcir l'alliage liant les microcomposants.

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