

Title (en)

HIGH-SPEED FABRICATION OF HIGHLY UNIFORM ULTRA-SMALL METALLIC MICROSPHERES

Title (de)

HOCHGESCHWINDIGKEITSHERSTELLUNG VON HÖCHSTGLEICHMÄSSIGEN ULTRAKLEINEN METALLISCHEN MIKROKUGELN

Title (fr)

FABRICATION A HAUTE VITESSE DE MICROSPHERES METALLIQUES A TRES PETITE ECHELLE

Publication

EP 1286789 A4 20040616 (EN)

Application

EP 01937626 A 20010521

Priority

- US 0116402 W 20010521
- US 20650800 P 20000522
- US 20650700 P 20000522
- US 27849501 P 20010323
- US 86079801 A 20010518
- US 86080301 A 20010518

Abstract (en)

[origin: WO0191525A2] In a high-speed fabrication process for producing highly uniform ultra-small metallic micro-spheres, a molten metal is passed through a small orifice, producing a stream of molten metal therefrom. A series of molten metal droplets forms from the break up of the capillary stream. Applied harmonic disturbances are used to control and generate satellite and parent droplets. Significantly, the satellite droplets formed are smaller than the orifice, allowing for the production of smaller metal balls and finer pitch conductive traces and ball grid arrays with larger orifices. The satellite droplets are separated from the parent droplets by electrostatic charging and deflection or by aerodynamic or acoustic sorting. In one embodiment, the satellite droplets are cooled before being collected to avoid defects and achieve high uniformity of the resulting metal balls. In another embodiment, the satellite droplets are electrostatically charged on a droplet-by-droplet basis and are then deflected by, e.g., an electric field to predetermined locations on a substrate. The satellite droplets can be placed in individual locations on the substrate (e.g., for forming a ball grid array) or can be overlapped to form conductive traces.

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IPC 8 full level

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CPC (source: EP US)

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Citation (search report)

- [X] US 3627862 A 19711214 - WEST DE WITT HENRY, et al
- [A] US 4068241 A 19780110 - YAMADA TAKAHIRO
- See references of WO 0191525A2

Cited by

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