Nanomanufacturing involves scaled-up, reliable, and cost-effective manufacturing of nanoscale materials, structures, devices, and systems. Nanomanufacturing methods can be classified into top-down and bottom-up approaches, including additive, subtractive, and replication/mass conservation processes. These include a cluster of various techniques such as nanomachining, nanofabrication, and nanometrology to produce nanotechnology components and conduct evaluation. This paper mainly focuses on the manufacturing methods for complex shapes or structures, such as textures on curves and hierarchical structures, and outlines the research perspectives and the current application status of nanomanufacturing fundamentals and key technologies.

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