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(54) Title: ROLL-TO-ROLL FABRICATION OF NANOSTRUCTURED FILM

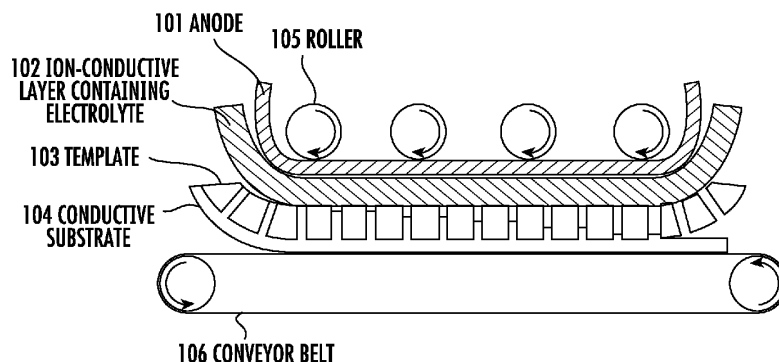


FIG. 1

(57) Abstract: A low-cost and highly controllable roll-to-roll templated deposition method for fabricating a nanostructured film comprising: creating a stacked structure comprising a conductive substrate, a porous template disposed on the substrate, an ion-conductive layer formed of a porous scaffold or a polymer gel containing electrolytes disposed on the template, and an anode disposed on the ion-conductive layer; providing rollers on the anode; applying pressure to the stacked structure via the rollers so that the first porous template conforms and stays attached to the substrate; applying galvanic potential between the metal anode and the conductive substrate to grow a nanostructure from the substrate into the porous template by electrochemical deposition; and removing the porous template by chemical dissolution or chemical etching to obtain the nanostructured film. Tube rollers comprising, radially, tubes, electrolytes, and anodes may replace the rollers, electrolytes, and anodes. The nanostructured film may also grow on both sides of the substrate.

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