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(54) **Title:** A METHOD OF FABRICATING TUNNEL TRANSISTORS WITH ABRUPT JUNCTIONS

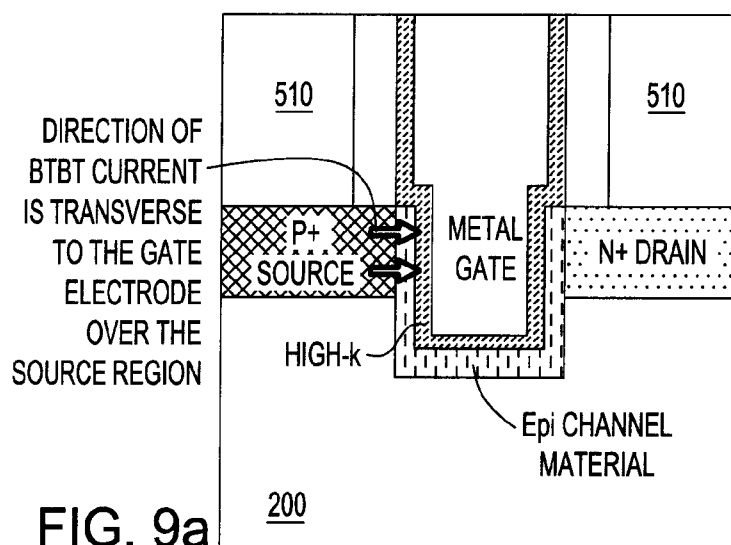


FIG. 9a

(57) **Abstract:** A method of manufacturing a tunnel field effect transistor (TFET) includes forming on a substrate (200) covered by an epitaxially grown source material (220) a dummy gate stack (310) surrounded by sidewall spacers (320); forming doped source (530) and drain (520) regions followed by forming an inter-layer dielectric (510) surrounding the sidewall spacers; removing the dummy gate stack (310), etching a self-aligned cavity (710); epitaxially growing a thin channel region within the self-aligned etch cavity; conformally depositing gate dielectric and metal gate materials within the self-aligned etch cavity; and planarizing the top surface of the replacement metal gate stack to remove the residues of the gate dielectric and metal gate materials.

