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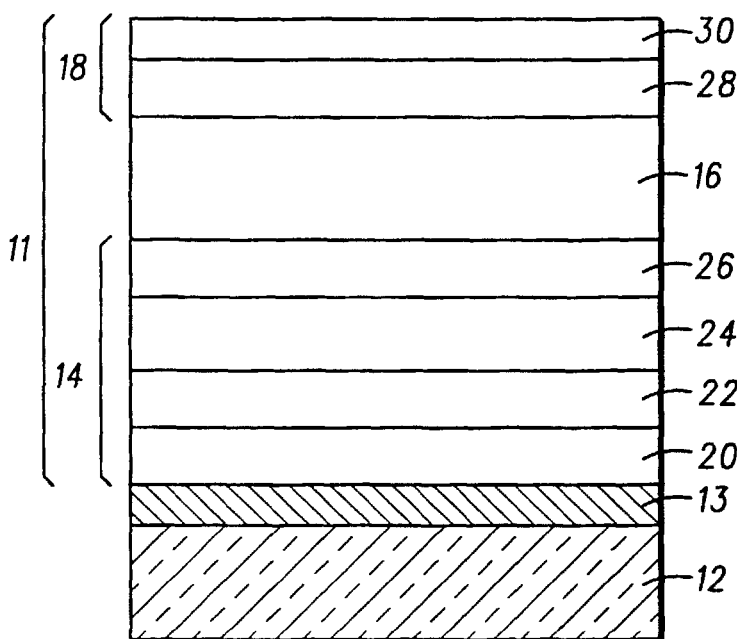
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(54) Title: MULTI-LAYER TUNNELING DEVICE WITH A GRADED STOICHIOMETRY INSULATING LAYER



(57) Abstract: An improved and novel multi-layer thin film device including a graded-stoichiometry insulating layer (16) and a method of fabricating a multi-layer thin film device including a graded-stoichiometry insulating layer (16). The device structure includes a substrate (12), a first electrode (14), a second electrode (18), and a graded-stoichiometry insulating, or tunnel-barrier, layer (16) formed between the first electrode (14) and the second electrode (18). The graded-stoichiometry insulating tunnel-barrier layer (16) includes graded stoichiometry to compensate for thickness profile and thereby produce a uniform tunnel-barrier resistance across the structure (10). In addition, included is a method of fabricating a multi-layer thin film device (10) including a graded-stoichiometry insulating tunnel-barrier layer (16) including the steps of providing (40) a substrate (12), depositing (44) a first electrode (14) on the substrate (12), depositing (46) a metal layer (21) on a surface of the first electrode (14),

reacting (50; 52; or 54) the metal layer (21) to form a insulating tunnel-barrier layer with uniform tunneling resistance (16) by using a non-uniform reaction process (21) and depositing (56) a second electrode (18) on the uniform tunneling insulating layer (16).

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