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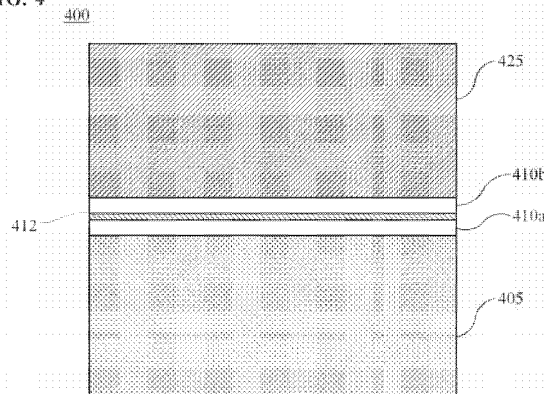
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(54) **Title:** NUCLEATION LAYERS FOR GROWTH OF GALLIUM-AND-NITROGEN-CONTAINING REGIONS

FIG. 4



(57) **Abstract:** Exemplary processing methods include forming a nucleation layer on a substrate. The nucleation layer may be formed by physical vapor deposition (PVD), and the physical vapor deposition may be characterized by a deposition temperature of greater than or about 700°C. The methods may further include forming a patterned mask layer on the nucleation layer. The patterned mask layer may include openings that expose portions of the nucleation layer. Gallium-and-nitrogen-containing regions may be formed on the exposed portions of the nucleation layer. In additional embodiments, the nucleation layer may include a first and second portions separated by an interlayer that stops the propagation of at least some dislocations in the nucleation layer.

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