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(54) Title: EPITAXY OF HIGH TENSILE SILICON ALLOY FOR TENSILE STRAIN APPLICATIONS

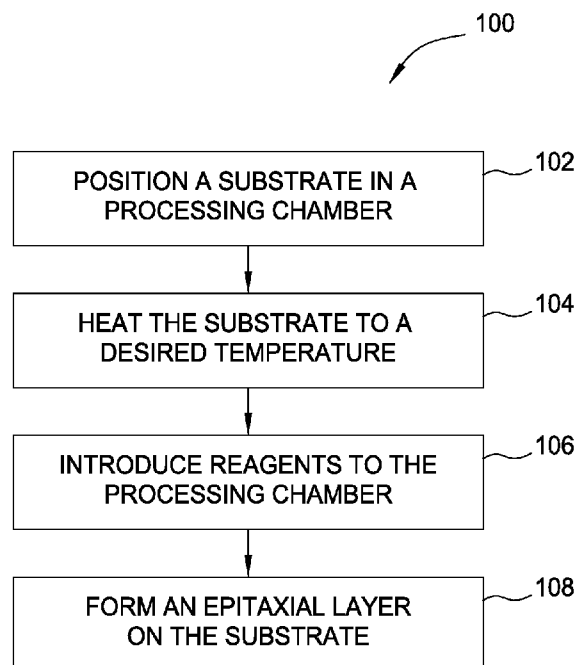


FIG. 1

(57) **Abstract:** Embodiments of the present invention generally relate to methods for forming silicon epitaxial layers on semiconductor devices. The methods include forming a silicon epitaxial layer on a substrate at increased pressure and reduced temperature. The silicon epitaxial layer has a phosphorus concentration of about 1×10^{21} atoms per cubic centimeter or greater, and is formed without the addition of carbon. A phosphorus concentration of about 1×10^{21} atoms per cubic centimeter or greater increases the tensile strain of the deposited layer, and thus, improves channel mobility. Since the epitaxial layer is substantially free of carbon, the epitaxial layer does not suffer from film formation and quality issues commonly associated with carbon-containing epitaxial layers.



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