# METHODS FOR GROWING A NITROGEN DOPED SINGLE CRYSTAL SILICON INGOT USING CONTINUOUS CZOCHRALSKI METHOD AND A SINGLE CRYSTAL SILICON INGOT GROWN BY THIS METHOD

## ABSTRACT

A method for growing a single crystal silicon ingot by the continuous Czochralski method is disclosed. The melt depth and thermal conditions are constant during growth because the silicon melt is continuously replenished as it is consumed, and the crucible location is fixed. The critical v/G is determined by the hot zone configuration, and the continuous replenishment of silicon to the melt during growth enables growth of the ingot at a constant pull rate consistent with the critical v/G during growth of a substantial portion of the main body of the ingot. The continuous replenishment of silicon is accompanied by periodic or continuous nitrogen addition to the melt to result in a nitrogen doped ingot.

FIG. 4A