CLAIMS:

1. A method of preparing a single crystal silicon ingot by the Continuous Czochralski method, the method comprising:

adding an initial charge of polycrystalline silicon to a crucible;

heating the crucible comprising the initial charge of polycrystalline silicon to cause a silicon melt to form in the crucible, the silicon melt comprising an initial volume of molten silicon and having an initial melt elevation level;

contacting a silicon seed crystal with a silicon melt;

withdrawing the silicon seed crystal to grow a neck portion, wherein the silicon seed crystal is withdrawn at a neck portion pull rate during growth of the neck portion;

withdrawing the silicon seed crystal to grow an outwardly flaring seed-cone adjacent the neck portion, wherein the silicon seed crystal is withdrawn at a seed-cone pull rate during growth of the outwardly flaring seed-cone; and

withdrawing the silicon seed crystal to grow a main body of the single crystal silicon ingot adjacent the outwardly flaring seed-cone, wherein the silicon melt comprises a volume of molten silicon and a melt elevation level during growth of the main body of the single crystal silicon ingot;

wherein the main body of the single crystal silicon ingot is grown at an initial variable main body pull rate and a constant main body pull rate, wherein the initial variable main body pull rate declines from a pull rate of between 0.5 mm/min and 2.0 mm/min to a minimum pull rate that may be as low as 0.3 mm/min and then rises to the constant main body pull rate, the constant main body pull rate being between 0.4 mm/min and 0.8 mm/min, wherein the pull rates are selected to achieve perfect silicon, wherein the main body of the single crystal silicon ingot is grown at the initial variable main body pull rate for less than 20% of a final length of the main body of the single crystal silicon ingot and grown at the constant main body pull rate during growth for at least 50% of the final length of the main body of the single crystal silicon ingot;

wherein polycrystalline silicon is continuously fed to the crucible to thereby replenish a volume of molten silicon and melt elevation level in the crucible during growth of the main body of the single crystal silicon ingot; and

wherein a magnetic field is applied to the silicon melt during growth of the main body of the single crystal silicon ingot.

2. The method of claim 1 wherein a horizontal magnetic field is applied to the silicon melt during growth of the main body of the single crystal silicon ingot.

3. The method of claim 1 wherein a cusp magnetic field is applied to the silicon melt during growth of the main body of the single crystal silicon ingot.

4. The method of claim 1 wherein the applied magnetic field maintains a substantially constant melt/solid interface profile during at least 70% of the growth of the main body of the single crystal silicon ingot.

5. The method of claim 1 wherein the applied magnetic field maintains a substantially constant melt/solid interface profile during between 70% and 90% of the growth of the main body of the single crystal silicon ingot.

6. The method of any one of claims 1 through 5 wherein the main body of the single crystal silicon ingot is at least 1000 millimeters long, at least 1400 millimeters long, or at least 1500 millimeters long.

7. The method of any one of claims 1 through 5 wherein the main body of the single crystal silicon ingot is at least 2000 millimeters long, at least 2200 millimeters long, at least 3000 millimeters long, or at least 4000 millimeters long.

8. The method of any one of claims 1 through 7 wherein the main body of the single crystal silicon ingot has a diameter of at least 150 millimeters, or at least 200 millimeters.

9. The method of any one of claims 1 through 7 wherein the main body of the single crystal silicon ingot has a diameter of at least 300 millimeters, or at least 450 millimeters.

10. The method of any one of claims 1 through 9 wherein the constant main body pull rate is between 0.4 mm/min and 0.7 mm/min, or between 0.4 mm/min and 0.65 mm/min.

11. The method of any one of claims 1 through 10 wherein the main body of the single crystal silicon ingot is grown at the initial variable main body pull rate for between 5% and 20% of the length of the main body of the single crystal silicon ingot.

12. The method of any one of claims 1 through 11 wherein the main body of the single crystal silicon ingot is grown at the constant main body pull rate during growth for at least 70% of the final length of the main body of the single crystal silicon ingot.

13. The method of any one of claims 1 through 11 wherein the main body of the single crystal silicon ingot is grown at the constant main body pull rate during growth for at least 80% of the final length of the main body of the single crystal silicon ingot.

14. The method of any one of claims 1 through 11 wherein the main body of the single crystal silicon ingot is grown at the constant main body pull rate during growth for at least 90% of the final length of the main body of the single crystal silicon ingot.

15. The method of any one of claims 1 through 14 wherein the constant main body pull rate is a constant critical pull rate sufficient to avoid agglomerated point defects over at least 70% of the length of the main body of the single crystal silicon ingot.

16. The method of any one of claims 1 through 14 wherein the constant main body pull rate is a constant critical pull rate sufficient to avoid agglomerated point defects over at least 90% of the length of the main body of the single crystal silicon ingot.

17. The method of any one of claims 1 through 16 wherein the volume of molten silicon varies by no more than 1.0 volume % during growth of at least 90% of the main body of the single crystal silicon ingot.

18. The method of any one of claims 1 through 16 wherein the volume of molten silicon varies by no more than 0.5 volume % during growth of at least 90% the main body of the single crystal silicon ingot.

19. The method of any one of claims 1 through 16 wherein the volume of molten silicon varies by no more than 0.1 volume % during growth of at least 90% of the main body of the single crystal silicon ingot.

20. The method of any one of claims 1 through 16 wherein the melt elevation level varies by less than +/- 0.5 millimeter during growth of at least 90% of the main body of the single crystal silicon ingot.

21. The method of any one of claims 1 through 20 wherein the main body of the single crystal silicon ingot comprises perfect silicon over at least 70% of the final length of the main body of the single crystal silicon ingot.

22. The method of any one of claims 1 through 20 wherein the main body of the single crystal silicon ingot comprises perfect silicon over at least 80% of the final length of the main body of the single crystal silicon ingot.

23. The method of any one of claims 1 through 20 wherein the main body of the single crystal silicon ingot comprises perfect silicon over at least 90% of the final length of the main body of the single crystal silicon ingot.