programs, or storage media that record programs, which are executed by the processor provided in the apparatus. It is to be understood that these are also encompassed within the scope of the present disclosure.

[0089] The graphs included in this disclosure are schematic. The scales and the like do not necessarily correspond to the actual ones.

INDUSTRIAL APPLICABILITY

[0090] According to the embodiment of this disclosure, the quality of a single crystal silicon ingot can be improved.

REFERENCE SIGNS LIST

[0091] 1 Production system

50 Control apparatus (52: Control section, 54: Memory section)

60 Data server

100 Pulling apparatus (10: Main chamber, 11: Pull chamber, 12: Gate valve, 13: Gas inlet, 14: Gas outlet, 16: Crucible, 16A: Quartz crucible, 16B: Graphite crucible, 18: Shaft, 20: Shaft drive mechanism, 22: Heat shield, 22A: Shield body, 22B: Inner flange, 22C: Outer flange, 24: Heater, 26: Insulator, 28: Seed chuck, 30: Pulling wire, 32: Wire lift mechanism, 34: Electromagnet, S: Seed crystal, M: Silicon melt, X: Pulling axis)

I Single crystal silicon ingot (I_n: Neck portion, I_s: Shoulder portion, I_b: Straight body portion, I_{b1}: First straight body portion, I_{b2}: Second straight body portion, I_t: Tail portion)