quality silicon ingot with high yield.

[0009]

The present invention is devised in view of the problems of prior art as described above, and object of the invention is to provide a polycrystalline silicon ingot casting mold and a method for producing the polycrystalline silicon ingot casting mold, in which a high-quality silicon ingot can be obtained at high yield by suppressing sticking of the casting mold surfaces and the silicon ingot, or losses and damages that occur when the solidified silicon ingot is released from the mold, and also a silicon nitride powder for mold release material for a polycrystalline silicon ingot casting mold and a slurry containing it.

Solution to Problem

[0010]

Inventors of the present invention conducted intensive studies to solve the problems described above, and as a result have found that, by using silicon nitride powder with different particle diameter as a raw material of a release layer, a high-quality silicon ingot can be obtained at high yield by suppressing losses or damages that occur when a solidified silicon ingot is released from the mold. Specifically, according to one aspect of the present invention, there is provided a method for producing a polycrystalline silicon ingot casting mold having a release layer, which is characterized by comprising a slurry forming step for forming

a slurry by mixing a silicon nitride powder with water, the silicon nitride powder being obtained by blending a silicon nitride powder (A) having an average particle diameter along the short axis of 0.6 to 13 μm with a silicon nitride powder (B) having an average particle diameter along the short axis of 0.1 to 0.3 μm at a weight ratio of 5 : 5 to 9 : 1, a slurry coating step for coating the surface of the mold with the slurry, and a heating step for heating the mold at 800 to 1200°C in an atmosphere containing oxygen, after the slurry coating step.

[0011]

Another aspect of the~~The~~ invention ~~also~~ provides silicon nitride powder for mold release material for a polycrystalline silicon ingot casting mold, which is characterized by comprising a silicon nitride powder (A) having an average particle diameter along the short axis of 0.6 to 13 μm and a silicon nitride powder (B) having an average particle diameter along the short axis of 0.1 to 0.3 μm at a weight ratio of 5 : 5 to 9 : 1. The invention also provides a slurry containing the silicon nitride powder for mold release material for a polycrystalline silicon ingot casting mold, in which the silicon nitride powder is mixed with water, and a polycrystalline silicon ingot casting mold, in which a release layer is formed on an inner surface of a mold by using the silicon nitride powder as defined above.

Advantageous Effects of Invention

[0012]