CLAIMS

[Claim 1] A method for manufacturing a perpendicular magnetic disk, comprising:

producing a perpendicular magnetic disk precursor having a substrate having a circular shape, a magnetic film~~, and a heat insulating~~ which is a magnetic recording layer provided ~~between~~ on the substrate, and ~~the~~ a soft magnetic ~~film~~layer; and

performing heat treatment of the magnetic film of the perpendicular magnetic disk precursor,

wherein the heat treatment increases ~~increasing~~ a magnetic anisotropy constant Ku of the magnetic film, and

the heat treatment is performed by spirally irradiating a main surface of the perpendicular magnetic disk precursor with a laser beam.

~~by performing heat treatment such that a temperature of the magnetic disk precursor on a surface side relative to the heat insulating layer is higher than a temperature of the magnetic disk precursor on the substrate side relative to the heat insulating layer.~~

~~[Claim 2] The method for manufacturing a magnetic disk according to claim 1,~~

~~wherein the heat treatment is performed by irradiating a surface of the magnetic disk precursor with a laser beam.~~

[Claim ~~3~~2] The method for manufacturing a perpendicular magnetic disk according to claim ~~2~~1,

wherein the heat treatment is performed ~~through~~ such that irradiating ~~irradiation~~ with ~~the~~ a laser beam ~~such that a focal point of the laser beam is aligned with the magnetic film.~~set to focus on the magnetic film.

[Claim 3] The method for manufacturing a perpendicular magnetic disk according to claim 1 or 2,

wherein a spot diameter of the laser beam on the main surface of the substrate is 0.5 to 5.0 mm.

[Claim 4] The method for manufacturing a perpendicular magnetic disk according to any one of claims 1 to 3,

wherein the substrate is an aluminum alloy substrate having a plating film made of a Ni-based alloy on the surface, or a glass substrate.

[Claim 5] The method for manufacturing a perpendicular magnetic disk according to any one of claims 1 to 4,

wherein the magnetic disk precursor has a heat insulating layer provided between the substrate and the magnetic film.

~~[Claim 4] The method for manufacturing a magnetic disk according to any one of claims 1 to 3,~~

~~wherein the heat insulating layer contains a metal oxide having a thermal conductivity of 40 [W/(m・K)] or less as a main component.~~

~~[Claim 5] A magnetic disk comprising:~~

~~a substrate;~~

~~a magnetic recording layer; and~~

~~a heat insulating layer provided between the substrate and the magnetic recording layer.~~

[Claim 6] The method for manufacturing a perpendicular magnetic disk according to claim 5,

wherein a main component of the heat insulating layer has a thermal conductivity of 40 [W/(m・K)] or less.

[Claim 7] The method for manufacturing a perpendicular magnetic disk according to any one of claims 1 to 6,

wherein the magnetic film contains an FePt-based alloy or a CoPt-based alloy.

~~[Claim 7] The magnetic disk according to claim 5 or 6,~~

~~wherein a main component of the heat insulating layer is a metal oxide.~~

[Claim 8] The method for manufacturing a perpendicular magnetic disk according to any one of claims ~~5~~ 1 to 7,

wherein the magnetic ~~recording layer~~film after heat treatment has an $L1_0$ crystal structure.

[Claim 9] The method for manufacturing a perpendicular magnetic disk according to any one of claims ~~5~~ 1 to 8,

wherein the ~~magnetic disk~~substrate has a ~~plate~~ thickness of 0.5 mm or less.~~, and~~

~~the heat insulating layer contains SiO_2 in an amount of 80% by weight or more and has a thickness of 5 nm or more.~~

[Claim 10] The method for manufacturing a perpendicular magnetic disk according to any one of claims 1 to 9,

wherein the magnetic disk is a magnetic disk for energy-assisted magnetic recording systems.

~~[Claim 10] A magnetic disk precursor comprising:~~

~~a substrate;~~

~~a magnetic film before being subjected to heat treatment, the magnetic film being to become a magnetic recording layer of a magnetic disk through the heat treatment; and~~

~~a heat insulating layer provided between the substrate and the magnetic film.~~

~~[Claim 11] The magnetic disk precursor according to claim 10, wherein a main component of the heat insulating layer has a thermal conductivity of 40 [W/(m•K)] or less.~~

~~[Claim 12] The magnetic disk precursor according to claim 10 or 11, wherein a main component of the heat insulating layer is a metal oxide.~~

~~[Claim 13] The magnetic disk precursor according to any one of claims 10 to 12, wherein the magnetic recording layer contains an FePt-based alloy or a CoPt-based alloy.~~