Summary of Invention

Technical Problem

[0005]

A thinner Al alloy substrate, however, may cause wobbling (fluttering) of the hard disk when the hard disk rotates in the hard disk device.

[0006]

A thinner Al alloy substrate causes another problem of a decrease in bearing strength of the hard disk substrate as well as a decrease in hardness. If such a hard disk comes in contact with a magnetic head, for example, in the hard disk device due to drop impact, fluttering or the like, the surface of the hard disk easily has scratches.

[0007]

In view of the above problems, the present invention aims to provide a thin hard disk substrate that is scratch-resistant on the disk surface and wobbles less during rotation, and to provide a hard disk device including such a hard disk substrate.

Solution to Problem

[0008]

To solve the above problems, a hard disk substrate of the present invention is a hard disk substrate including an aluminum alloy substrate having NiP plating films on the surfaces.

The aluminum alloy substrate having a thickness of 0.338 mm or more and 0.635mm or less. The aluminum alloy substrate has a Vickers hardness of 60 Hv or more, a ratio between a plating thickness of the NiP plating films and a thickness of the Al alloy substrate is 3.8% or more, a Young's modulus of the hard disk substrate is 74.6 GPa or more, and a Vickers hardness of the hard disk substrate is 293 Hv or more and 616Hv or less.

[0009]

A hard disk substrate of the present invention has the following features.

the sum of the plating thicknesses of the NiP plating films on both faces is 22 μm or more and 60 μm or less so that a plating thickness ratio is 3.8% or more according to the thickness of the aluminum alloy substrate.

The NiP plating films include a single layer.

There is disclosed a hard disk device including such a hard disk substrate as well.

Advantageous Effects of Invention

[0010]

A hard disk substrate according to the present invention during use in a hard disk device reduces scratches on the surface of the hard disk and reduces the amplitude due to fluttering during the rotation of the hard disk.

[0011]

Further features of the present invention will be clear from the following descriptions and the attached drawings. Other problems, configurations and advantageous effects also will be clear from the following descriptions of the embodiment.

Brief Description of Drawings

[0012]

Fig. 1 is a schematic cross-sectional view of a hard disk substrate.

Fig. 2 is a graph showing the relationship between the plating thickness/substrate thickness ratio and the Vickers hardness.

Fig. 3 is a graph showing the relationship between the plating thickness/ substrate thickness ratio and the Young's modulus.

Fig. 4 is a graph showing the relationship between the plating thickness/ substrate thickness ratio and the Vickers hardness.

Fig. 5 is a graph showing the relationship between the plating thickness/

Claims

[Claim 1]

A hard disk substrate comprising an aluminum alloy substrate having NiP plating films on the surfaces,

the aluminum alloy substrate having a thickness of 0.338 mm or more and 0.635mm or less,

the aluminum alloy substrate having a Vickers hardness of 60 Hv or more,

a ratio between a thickness of the NiP plating films and a thickness of the Al alloy substrate being 3.8% or more,

a Young's modulus of the hard disk substrate being 74.6 GPa or more, and

a Vickers hardness of the hard disk substrate being 293 Hv or more and 616Hv or less.

[Claim 2]

The hard disk substrate according to claim 1, the plating thickness of the NiP plating films is 22 μm or more and 60 μm or less so that a plating thickness ratio is 3.8% or more according to the thickness of the aluminum alloy substrate.

[Claim 3]

The hard disk substrate according to claim 1, wherein the NiP plating films include a single layer.