SUMMARY OF EMBODIMENTS

[0005] Embodiments of the invention are directed toward an iron-oxidized hard disk drive (HDD) cover, a hard disk drive comprising such a cover, and associated methods for manufacturing such a cover. An iron-oxidized HDD cover according to embodiments comprises an inner surface that is substantially free of un-oxidized, or "pure", metallic iron. According to embodiments, the iron-oxidized cover is manufactured by baking a stainless steel cover, thereby oxidizing the cover surface of iron. For example and according to an embodiment, the iron oxide concentration on the surface of the cover may be at least about ten times the chromium oxide concentration. Consequently, because the cover is iron-oxidized a relatively expensive nickel-plating process may be foregone while the Fe smear problem may be significantly reduced. Furthermore, such an iron-oxidized cover is especially beneficial for, though not limited to, use as an inner cover in a sealed HDD.

In one aspect, there is provided a hard disk drive comprising: a base; at least one disk media rotatably mounted on a spindle; a head slider comprising a read/write head configured to read from and to write to said disk media; a voice coil actuator configured to move said head slider to access portions of said disk media; and a pre-oxidized cover coupled with said base to form an enclosure for said disk media, head slider and voice coil actuator, wherein a surface of said pre-oxidized cover is substantially free of un-oxidized metallic iron. The pre-oxidized cover is composed of baked stainless steel.

In another aspect, there is provided an iron-oxidized cover for a hard disk drive enclosure, said cover comprising: an inner surface substantially free of un-oxidized iron, wherein an iron oxide concentration on said inner surface is at least about ten times a chromium oxide concentration of said inner surface, wherein said iron-oxidized cover is composed of baked stainless steel.

In another aspect, there is provided a method of manufacturing a cover for a hard disk drive, the method comprising: baking a stainless steel cover part to substantially fully oxidize iron on a surface of said cover part, such that an iron oxide concentration on said surface is at least about 10 times a chromium oxide concentration on said surface.

[0006] Embodiments discussed in the Summary of Embodiments section are not meant to suggest, describe, or teach all the embodiments discussed herein. Thus, embodiments of the invention may contain additional or different features than those discussed in this section. Furthermore, no limitation, element, property, feature, advantage, attribute, or the like expressed in this section, which is not expressly recited in a claim, limits the scope of any claim in any way.

CLAIMS

What is claimed is:

1. A hard disk drive comprising:

a base;

at least one disk media rotatably mounted on a spindle;

a head slider comprising a read/write head configured to read from and to write to said disk media;

a voice coil actuator configured to move said head slider to access portions of said disk media; and

a pre-oxidized cover coupled with said base to form an enclosure for said disk media, head slider and voice coil actuator, wherein a surface of said pre-oxidized cover is substantially free of un-oxidized metallic iron, wherein said pre-oxidized cover is composed of baked stainless steel.

2. The hard disk drive of claim 1, wherein an iron oxide concentration on said surface of said pre-oxidized cover is at least about ten times a chromium oxide concentration of said surface of said pre-oxidized cover.

3. The hard disk drive of claim 1, wherein said pre-oxidized cover is not nickel-plated.

4. The hard disk drive of claim 1, wherein said pre-oxidized cover is a first cover, said hard disk drive further comprising:

a second cover affixed to said first cover to form a hermetically sealed enclosure.

5. The hard disk drive of claim 4, wherein said sealed enclosure is substantially filled with a gas that is lighter than air.

6. The hard disk drive of claim 4, wherein said sealed enclosure is substantially filled with a predominantly helium gas.

7. An iron-oxidized cover for a hard disk drive enclosure, said cover comprising:

an inner surface substantially free of un-oxidized iron, wherein an iron oxide concentration on said inner surface is at least about ten times a chromium oxide concentration of said inner surface, wherein said iron-oxidized cover is composed of baked stainless steel.

8. The iron-oxidized cover of claim 7, wherein said iron-oxidized cover is not nickel-plated.

9. A method of manufacturing a cover for a hard disk drive, the method comprising:

baking a stainless steel cover part to substantially fully oxidize iron on a surface of said cover part, such that an iron oxide concentration on said surface is at least about 10 times a chromium oxide concentration on said surface.

10. The method of claim 9, wherein said stainless steel cover part is not nickel-plated.