CLAIMS

WHAT IS CLAIMED IS:

1. A bias magnetic field control method, the bias magnetic field being a horizontal magnetic field, comprising:

at S1, rotating a bias magnetic field device by a fixed angle along a circumferential direction of a base every first preset application time length of a target to periodically change an area on a surface of the target where the bias magnetic field acts on, until a total application time length of the target accumulates to reach an upper limit, each time the bias magnetic field device being rotated in a same direction.

2. The bias magnetic field control method according to claim 1, further comprising, before step S1:

at S0, measuring a center angle corresponding to an arc length of a deepest recessed area or a shallowest recessed area formed on the surface of the target after a second preset application time length of the target, and the fixed angle being smaller than or equal to the center angle in step S1.

3. The bias magnetic field control method according to claim 2, wherein the first application time length of the target and the second application time length of the target are time lengths required for consumption of the target to reach nKWh, n being a constant greater than or equal to 10.

4. The bias magnetic field control method according to claim 2, wherein:

during a sputtering process, a position of the bias magnetic field device is unchanged; and

each time in response to reaching the first application time length of the target, the sputtering process is stopped, and the bias magnetic field device is rotated the fixed angle along the circumferential direction of the base.

5. The bias magnetic field control method according to claim 3, wherein n is equal to 50.

6. The bias magnetic field control method according to any one of claims 1-5, wherein in step S1, a sum of a plurality of fixed angles of a plurality of rotations of the bias magnetic field device is greater than or equal to 180°.

7. A magnetic thin film deposition method used to deposit a magnetic film layer on a to-be-processed workpiece by using a horizontal bias magnetic field, the magnetic thin film deposition method comprising the following steps:

at S10, determining whether a total application time length of a target accumulates to reach an upper limit, if yes, stopping a flow, if not, performing step S11;

at S11, performing a sputtering process and performing step S12 after the sputtering process is stopped;

at S12, determining whether a first application time length of the target passes, if yes, performing step S13, if not, returning back to step S10; and

at S13, rotating a bias magnetic field device a fixed angle along a circumferential direction of a base and returning back to step S10, each time the bias magnetic field device being rotated in a same direction.

8. The magnetic thin film deposition method according to claim 7, wherein material of the magnetic film layer includes NiFe alloy, amorphous magnetic material, and magnetic material containing Co-base, Fe-base, and/or Ni-base.

9. A magnetic thin film deposition chamber comprising a chamber body and a bias magnetic field device, a base being arranged in the chamber body and configured to carry a to-be-processed workpiece, and a target being arranged at a top inside the chamber body; the bias magnetic field device being configured to form a horizontal magnetic field above the base, the horizontal magnetic field being used to deposit a magnetic film layer on the to-be-processed workpiece, wherein the magnetic thin film deposition chamber further includes a bias magnetic field control device, the bias magnetic field control device being configured to drive the bias magnetic field device to rotate by a fixed angle along a circumferential direction of the base, each time the bias magnetic field device being rotated in a same direction.

10. The magnetic thin film deposition chamber according to claim 9, wherein the bias magnetic field control device includes:

a rotation platform, the rotation platform being made of non-magnetic material and configured to support the bias magnetic field device; and

a rotation drive mechanism configured to drive the rotation platform to rotate the fixed angle around an axis of the base.

11. The magnetic thin film deposition chamber according to claim 9 or 10, wherein the bias magnetic field device is arranged on an inner side of a sidewall of the chamber body and

around the base, or the bias magnetic field device is arranged around the chamber body on an outer side of the sidewall of the chamber body.

12. A magnetic thin film deposition apparatus comprising at least a deposition chamber configured to deposit a magnetic film layer, wherein each deposition chamber includes the magnetic thin film deposition chamber according to any one of claims 9 to 11.