CLAIMS

1. A ring-shaped glass spacer to be arranged in contact with a magnetic disk in a hard disk drive apparatus,

wherein a surface roughness Ra of a main surface of the glass spacer that comes into contact with the magnetic disk is not larger than 1.0 μm, and an average inclination RΔa of the main surface that is obtained using the following Equation (1) is at least 0.02,

a conductive film is formed at least on the main surface of the glass spacer,

Equation 1

$$R\Delta a = \frac{1}{n}\sum_{i=1}^{n}\left|\frac{dz_i}{dX}\right| \ldots (1)$$

here, dz_i/dX is expressed by the following Equation (2), ΔX represents a data interval [μm] between measurement data pieces of surface roughness, z_i (i is a natural number) represents the i-th measurement data piece, and n represents a total number (n > 6) of measurement data pieces

Equation 2

$$\frac{dz_i}{dX} = \frac{1}{60 \cdot \Delta X}(z_{i+3} - 9z_{i+2} + 45z_{i+1} - 45z_{i-1} + 9z_{i-2} - z_{i-3}) \ldots (2).$$

2. The glass spacer according to claim 1,
wherein the average inclination RΔa is not less than 0.05.

3. The glass spacer according to claim 1 or 2,
wherein the average inclination RΔa is not less than 0.10.

4. The glass spacer according to any one of claims 1 to 3,
wherein the surface roughness Ra is not larger than 0.5 μm.

5. A hard disk drive apparatus comprising
the glass spacer according to any one of claims 1 to 4 and the magnetic disk.

6. The hard disk drive apparatus according to claim 5,

wherein the magnetic disk includes a glass substrate and a magnetic film that is formed on the glass substrate.

7. The hard disk drive apparatus according to claim 5 or 6,

wherein a surface roughness Ra of a main surface of the magnetic disk is not larger than 0.3 nm.

8. The hard disk drive apparatus according to any one of claims 5 to 7,

wherein eight or more magnetic disks are installed in the hard disk drive apparatus.

9. A method for manufacturing a ring-shaped glass spacer to be arranged in contact with a magnetic disk in a hard disk drive apparatus, the method comprising at least steps of:

preparing a ring-shaped glass blank, and

performing grinding the main surface of the ring-shaped glass blank using a grinding pad in which aggregates formed by bonding minute diamond particles through vitrification as fixed abrasive particles,

wherein performing grinding the main surface of the ring-shaped glass blank is performed such that the main surface of the ring-shaped glass blank has an arithmetic mean roughness Ra of not larger than 1.0 μm and has an average inclination RΔa of not less than 0.02.

10 The method for manufacturing a ring-shaped glass spacer according to claim 9, further comprising the step of:

forming a conductive film at least on the main surface of the ring-shaped glass blank.