Claims

1. A hybrid dynamic pressure gas radial bearing, characterized in that: comprising a bearing outer sleeve,

an inner sleeve, and

a foil type elastic part arranged between the bearing outer sleeve and the inner sleeve,

wherein an outer circumferential face, a left end face and a right end face of the bearing inner sleeve are respectively provided with regular groove-type patterns,

the regular groove-type patterns on one of the end faces are in mirror symmetry with the groove-type pattern on the another end face,

axial contour lines of the regular groove-type patterns on the outer circumference face, and radial contour lines of the regular groove-type patterns on the left end face and on the right end face are in one-to-one correspondence and are connected to each other;

axial high-position lines of the regular groove-type patterns on the outer circumferential face of the bearing inner sleeve correspond to radial high-position lines of the regular groove-type patterns on the left end face and the right end face, and are connected with each other in front of the outer circumferential chamfer;

axial middle-position lines of the regular groove-type patterns on the outer circumferential face correspond to radial middle-position lines of the regular groove-type patterns on the left and right end faces, and are connected with each other in front of the outer circumferential chamfer; and

axial low-position lines of the regular groove-type patterns on the outer circumferential face correspond to radial low-position lines of the regular groove-type patterns on the left and right end faces, and are connected with each other in front of the circumferential chamfer.

Claims

2. The hybrid dynamic pressure gas radial bearing according to claim 1, characterized in that
a wear-resistant coating is arranged on matching faces between the foil type elastic part and the outer circumferential face of the bearing inner sleeve.

3. The hybrid dynamic pressure gas radial bearing according to claim 1 or 2, characterized in that
a fit clearance between the foil type elastic part and the bearing inner sleeve is 0.003-0.008 mm.

4. The hybrid dynamic pressure gas radial bearing according to claim 1, characterized in that
two ends of the foil type elastic part are both fixed on an inner circumferential wall of the bearing outer sleeve.

5. The hybrid dynamic pressure gas radial bearing according to claim 1 or 4, characterized in that
the foil type elastic parts are multiple pieces, and the foil type elastic parts are uniformly distributed along the inner circumferential wall of the bearing outer sleeve.

6. The hybrid dynamic pressure gas radial bearing according to claim 1 or 4, characterized in that
a clamping groove used for fixing the foil type elastic part is formed in the inner circumferential wall of the bearing outer sleeve.

7. The hybrid dynamic pressure gas radial bearing according to claim 1, characterized in that
the foil type elastic part is subjected to surface heat treatment.

Claims

8. The hybrid dynamic pressure gas radial bearing according to claim 1 or 7, characterized in that
the foil type elastic part is composed of a wave foil and a flat foil;
a top end of an arc-shaped protrusion of the wave foil is attached to the flat foil;
a transition bottom edge of wave arches of the wave foil is attached to the inner circumferential wall of the bearing outer sleeve.

9. The hybrid dynamic pressure gas radial bearing according to claim 1 or 7, characterized in that
the foil type elastic part is composed of a wave foil and a flat foil,
the top end of the arc-shaped protrusion of the wave foil is attached to the inner circumferential wall of the bearing outer sleeve, and
the transition bottom edge between the wave arches of the wave foil is attached to the flat foil.

10. The hybrid dynamic pressure gas radial bearing according to claim 1 or 7, characterized in that
the foil type elastic part is composed of two flat foils, through holes being formed in the flat foils close to the inner circumferential wall of the bearing outer sleeve.

11. The hybrid dynamic pressure gas radial bearing according to claim 1, characterized in that
stop rings are arranged at two ends of the bearing outer sleeve.

Claims

12. The hybrid dynamic pressure gas radial bearing according to claim 11, characterized in that

through holes and concave holes are coaxial and formed on the outer circumference of the bearing outer sleeve, and

the through holes are located within the concave holes along their common axis.