CLAIMS

1. An electric power generator comprising a rotor and a plurality of stators, wherein:

the rotor and the plurality of stators are arranged coaxially and concentrically about a central axis;

the plurality of stators includes an inner stator provided radially inwardly of the rotor, the inner stator and the rotor being separated by an inner airgap;

the plurality of stators includes an outer stator provided radially outwardly of the rotor, the outer stator and the rotor being separated by an outer airgap;

each of the inner and outer stators have respective windings configured to have electric current induced therein;

the rotor includes a plurality of magnetic pole structures configured to provide or generate a magnetic field having plurality of magnetic poles configured, in use, to induce the current in the windings; and

the rotor is not of uniform cross-sectional thickness, wherein:

an inner surface of the rotor bulges radially inwardly at the magnetic pole structures, the inner airgap thus being non-uniform in that the inner airgap is radially shorter at the magnetic pole structures and radially longer in between the magnetic pole structures; and

an outer surface of the rotor bulges radially outwardly at the magnetic pole structures, the outer airgap thus being non-uniform in that the outer airgap is radially shorter at the magnetic pole structures and radially longer in between the magnetic pole structures.

2. The electric power generator of claim 1, wherein the rotor has an average or median radius of curvature and radially inner and outer surfaces between the magnetic pole structures have a radius of curvature concentric with the average radius of curvature.

3. The electric power generator of claim 1, wherein:

the outer surface of each magnetic pole structure has a smaller radius of curvature than a displacement arc which the outer surface describes; and

the inner surface of each magnetic pole structure has a larger radius of curvature than a displacement arc which the inner surface describes.

4. The electric power generator of claim 1, wherein the outer airgap is, on average, radially longer than the inner airgap.

5. The electric power generator of claim 1, wherein the inner airgap is 5 – 50 mm at a radially shortest point.

6. The electric power generator of claim 1, wherein the inner airgap is 10 – 95 mm at a radially longest point.

7. The electric power generator of claim 1, wherein the outer airgap is 20 – 100 mm at a radially shortest point.

8. The electric power generator of claim 1, wherein the outer airgap is 30 – 165 mm at a radially longest point.

9. The electric power generator of claim 1, wherein the rotor includes intermediate support structures between adjacent magnetic pole structures to provide a constant or uninterrupted circumferentially extending rotor.

10. The electric power generator of claim 1, wherein the inner stator presents a generally circular outer surface and the inner airgap is generally uniform at an inner boundary provided by the outer surface of the inner stator but non-uniform at an outer boundary provided by the inner surface of the rotor.

11. The electric power generator of claim 1, wherein the outer stator presents a generally circular inner surface and the outer airgap is generally uniform at an outer boundary provided by the inner surface of the outer stator but non-uniform at an inner boundary provided by the outer surface of the rotor.

12. The electric power generator of claim 1, wherein:

the inner airgap ranges from 15 mm to 55 mm at a shortest distance and ranges from 55 mm to 95 mm at a longest distance;

the outer airgap ranges from 25 mm to 55 mm at a shortest distance and ranges from 60 mm to 120 mm at a longest distance; and

when increasing current of the outer stator and keeping current of the inner stator constant, total harmonics distortion of the voltage on the outer stator are reduced to at least 0.44%.

13. The electric power generator of claim 1, wherein:

the inner airgap ranges from 25 mm to 65 mm at a shortest distance and ranges from 45 mm to 110 mm at a longest distance;

the outer airgap ranges from 65 mm to 110 mm at a shortest distance and ranges from 94 mm to 140 mm at a longest distance; and

when increasing current of both the inner stator and the outer stator, harmonics and total harmonic distortion of both the inner stator and the outer stator are decreased by at least 4%.

14. The electric power generator of claim 1, wherein:

the inner airgap ranges from 25 mm to 85 mm at a shortest distance and ranges from 65 mm to 100 mm at a longest distance;

the outer airgap ranges from 35 mm to 55 mm at a shortest distance and ranges from 63 mm to 120 mm at a longest distance; and

when current on the inner stator is decreased, harmonics and total harmonic distortion is decreased by at least 3% in both the inner stator and the outer stator.

15. The electric power generator of claim 1, wherein:

the inner airgap ranges from 5 mm to 50 mm at a shortest distance and ranges from 10 mm to 95 mm at a longest distance; and

the outer airgap ranges from 20 mm to 140 mm at a shortest distance and ranges from 30 mm to 165 mm at a longest distance.