CLAIMS

1. A rotating equipment including:

a housing;

at least one impeller contained in the housing;

a first plurality of externally pressurized gas bearings configured to support the at least one impeller radially; and

a second plurality of externally pressurized gas bearings configured to support the impeller axially.

2. The rotating equipment of claim 1 wherein the at least one impeller is arranged along a shaft.

3. The rotating equipment of claim 2 wherein the shaft is fixed; and the first plurality of externally pressurized gas bearings are arranged between the shaft and each of the at least one impellers.

4. The rotating equipment of claim 2 wherein the at least one impeller is at least two impellers, and the first plurality of externally pressurized gas bearings are arranged along the shaft in-between each of the at least one impeller.

5. The rotating equipment of claim 2 wherein the first plurality of externally pressurized gas bearings are arranged along the shaft on either side the at least one

impeller.

6. The rotating equipment of claim 1 wherein either of the first plurality of externally pressurized bearings or the second plurality of externally pressurized bearings are configured to serve as a seal.

7. The rotating equipment of claim 1 wherein the at least one impeller is at least two impellers, and each of the impellers are driven at different speeds.

8. The rotating equipment of claim 1 wherein either of the first plurality externally pressurized bearings or the second plurality of externally pressurized bearings are also a magnetic element in a motor or generator.

9. The rotating equipment of claim 1 wherein the second plurality of externally pressurized gas bearings are arranged on opposite sides of each of the at least one impeller to provide axial support.

10. The rotating equipment of claim 1 wherein each of the first plurality externally pressurized bearings or the second plurality of externally pressurized bearings include a porous restriction selected from the group of graphite, carbon, silicon carbide, tungsten carbide, alumina, neodymium, or other sintered materials and combinations thereof.

11. The rotating equipment of claim 1 wherein each of the first plurality externally pressurized bearings or the second plurality of externally pressurized bearings include a porous restriction formed using a 3-D printing process.