

CLAIMS

What is claimed is:

Claim 1. A flux machine comprising:

- 5 a stator and at least one rotor, wherein the at least one rotor is capable of rotating around a central axis in a rotary direction;
- plural coil assemblies arranged around a stator wherein each one of the coil assemblies has a form positioned in a plane orthogonal to the rotary direction, and plural magnet sets each arranged circularly around at the least one rotor and positioned so that a magnet of each magnet set comes
- 10 within close proximity to each of said coil assemblies;
- each said plural coil assemblies and each said plural magnet sets supported by at least one axle aligned with said central axis wherein rotary motion about said at least one of said at least one axle is executed when electrical current is present in said coil assemblies;
- characterized in that magnetic flux of the plural magnet sets is directed orthogonal to said rotary motion;
- 15 and further characterized in that like pole faces of pairs of said magnets of each of said sets of magnets are in mutually facing positions.

Claim 2. The flux machine of claim 1 wherein said magnet sets comprise between one and a plurality of magnets wherein said magnets are one of permanent magnets, electromagnets, and a combination of

20 permanent magnets and electromagnets.

Claim 3. The flux machine of claim 2 wherein said coil assemblies have side edges and said magnets conform to said side edges wherein gaps between said coil assemblies and magnets is minimized.

- 25 Claim 4. The flux machine of claim 2 wherein said at least one rotor rotates about at least one axle or a plurality of mutually coaxial axles.

Claim 5. The flux machine of claim 4 wherein each one of said magnets is supported by one of said coaxial axles.

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Claim 6. The flux machine of claim 1 wherein magnetic flux of said magnets is directed in at least one of axially and radially.

Claim 7. The flux machine of claim 1 wherein magnetic flux of said plural magnet sets is directed in two opposite axial directions and two opposite radial directions..

Claim 8. The flux machine of claim 1 wherein said coil assemblies are rectangular or near rectangular.

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Claim 9. The flux machine of claim 1 wherein said coil assemblies are oval in shape and the magnet sets are curvilinear in shape.

Claim 10. The flux machine of claim 1 wherein magnetic flux of said magnets is directed perpendicularly to the current in the coil at the location of each magnet, consisting of axial flux and radial flux.

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Claim 11. The flux machine of claim 1 wherein each coil assembly on the stator is surrounded by three magnets on a first of at least one rotor and a fourth magnet is positioned on a second of at least one rotor.

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Claim 12. The flux machine of claim 1 wherein each coil assembly on the stator is surrounded by two magnets that direct flux in direction orthogonal to each other on a first of the at least one rotor, a third magnet on a second of the at least one rotor, and a fourth magnet on a third of the at least one rotor.

Claim 13. The flux machine of claim 12, wherein the three rotors operator on axels that may rotate independently of each other.

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Claim 14. The flux machine of claim 13, wherein the at least one of the three rotors is capable of functioning as a generator simultaneously as at least one of the three rotors is capable of functioning as a motor.

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Claim 15. The flux machine of claim 1 wherein the electrical coils are within channels of permeable cores.

Claim 16. A flux machine, having an axis of rotation, said machine comprising and characterize by:

a rotor having plural electrical coils wherein each one of said electrical coils has a coil form positioned orthogonal to a direction of rotation of a rotor about the axis of rotation;

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a stator having plural sets of magnets, wherein each magnet of each set of magnets is positioned to move into adjacency with one side of each one of said electrical coils during rotation of the stator; and wherein like pole faces of pairs of magnets of each of said sets of magnets are in mutually facing positions.

Claim 17. The flux machine of claim 16 wherein said magnet sets comprise between one and a plurality of magnets wherein said magnets are one of permanent magnets, electromagnets, and a combination of permanent magnets and electromagnets.

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Claim 18. The flux machine of claim 17 wherein said coil assemblies have side edges and said magnets conform to said side edges wherein gaps between said coil assemblies and magnets is minimized.

Claim 19. The flux machine of claim 16 wherein magnetic flux of said magnets is directed axially and radially.

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Claim 20. The flux machine of claim 19 wherein said rotary motion is orthogonal to said magnetic flux.

Claim 21. The flux machine of claim 16 wherein said coil assemblies are rectangular or near rectangular.

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Claim 22. The flux machine of claim 16 wherein said coil assemblies are oval in shape and the magnet sets are curvilinear in shape.

Claim 23. The flux machine of claim 16 wherein magnetic flux of said magnets is directed perpendicularly to the current in the coil at the location of each magnet, consisting of axial flux and radial flux.

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Claim 24. The flux machine of claim 16 wherein each coil assembly on the rotor is surrounded by four magnets on the stator.

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Claim 25. The flux machine of claim 16 wherein the electrical coils are within channels of permeable cores.

Claim 26. A method of operating a flux machine as a generator and a motor simultaneously comprising and characterized by:

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at least one rotor and one stator, and plural coil assemblies distributed on at least one stator and plural magnet sets distributed on the at least one rotor, wherein said coil assemblies and magnet sets are arranged circularly and in mutual close proximity about a central axis, and wherein one of said plural coil assemblies or said plural magnet sets is supported by at least one axle aligned with said central axis wherein rotary motion about said at least one axle is

executed when electrical current is present in said coil assemblies, and wherein said coil assemblies and plural magnet sets are positioned relative to each other so that magnet flux from said plural magnet sets is directed orthogonal to said rotary motion;

- 5 driving a first rotor externally to induce a Faraday current in the plural coil assemblies while a second rotor is simultaneously driven by the current in the stator coils.

Claim 27. The method of operating a flux machine of claim 26 including selecting magnets of said magnet sets as one of permanent magnets, electromagnets, and a combination of permanent magnets and
10 electromagnets.

Claim 28. The method of operating a flux machine of claim 26 including placing said coil assemblies and said magnets to minimize gaps there between.

- 15 Claim 29. The method of operating a flux machine of claim 26 including positioning said at least one axle as a plurality of mutually coaxial axles.

Claim 30. The method of operating a flux machine of claim 29 including supporting each one of said magnets by one of said coaxial axles.
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Claim 31: The method of operating a flux machine of claim 26 wherein the frequencies at which the first and second rotors are driving with respect to each other is selected to influence the current flow in the stator coils such that harmonic contributions are minimized.

- 25 Claim 32. The method of operating a flux machine of claim 26 wherein the second rotor is driven at the same frequency as the first rotor.

Claim 33. The method of operating a flux machine of claim 26 wherein said magnet flux from said plural magnet sets is directed in at least one of axially and radially directions.
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Claim 34. The method of operating a flux machine of claim 26 wherein said rotary motion is orthogonal to said magnetic flux.