CLAIMS

1. A method for constructing a solenoid inductor, comprising:
positioning an inner winding substantially around a magnetic core;
positioning an outer winding substantially around the inner winding;
using a layered process to perform said positioning the inner and outer windings;
processing a first conducting layer that is a bottom layer of the outer winding;
processing a first dielectric layer above the first conducting layer;
processing a second conducting layer above the first dielectric layer that is a bottom layer of the inner winding;
processing a second dielectric layer above the second conducting layer;
processing a magnetic core layer above the second dielectric layer;
processing a third dielectric layer above the magnetic core layer;
processing a third conducting layer above the third dielectric layer that is a top layer of the inner winding;
processing a fourth dielectric layer above the third conducting layer;
processing a fourth conducting layer above the fourth dielectric layer that is a top layer of the outer winding; and
processing a fifth dielectric layer above the fourth conducting layer;
wherein the inner and outer windings are electrically connected.

2. The method of claim 1, wherein said using the layered process further comprises:
processing vertical conductors through the first, second, third and fourth dielectric layers to electrically connect the bottom and top layers of the outer winding; and
processing vertical conductors through the second and third dielectric layers to electrically connect the bottom and top layers of the inner winding.

3. The method of claim 2, wherein said using the layered process further comprises:
for each conducting layer of the first, second, third and fourth conducting layers:

separating the conducting layer into multiple conductors;

wherein said processing vertical conductors through the first, second, third and fourth dielectric layers to electrically connect the bottom and top layers of the outer winding comprises electrically connecting corresponding ones of the multiple conductors of the bottom and top layers of the outer winding to form corresponding turns of the outer winding; and

wherein said processing the vertical conductors through the second and third dielectric layers to electrically connect the bottom and top layers of the inner winding comprises electrically connecting corresponding ones of the multiple conductors of the bottom and top layers of the inner winding to form corresponding turns of the inner winding.

4. The method of claim 1, wherein the inner and outer windings are electrically connected serially to generate non-opposing magnetic fields in the magnetic core.

5. The method of claim 4, further comprising:

positioning additional windings substantially around the inner and outer windings using the layered process;

wherein each successive additional winding of the additional windings is substantially positioned around previous additional windings; and

wherein the inner and outer and additional windings are electrically connected serially and in a manner such as to generate non-opposing magnetic fields in the magnetic core.

6. The method of claim 1, wherein the inner and outer windings are electrically connected to generate opposing magnetic fields in the magnetic core.

7. The method of claim 6, wherein the inner and outer windings have different numbers of turns.

8. The method of claim 7, wherein the different numbers of turns provide substantially matching respective inductance values of the inner and outer windings.

9. The method of claim 6, further comprising:
positioning an even number of additional windings substantially around the inner and outer windings using the layered process;
wherein each successive additional winding of the additional windings is substantially positioned around previous additional windings; and
wherein the inner and outer windings and additional windings are electrically connected in a manner such that an outer half of all the windings layers generate magnetic fields in the magnetic core that oppose magnetic fields generated in the magnetic core by an inner half of all the windings layers.

10. The method of claim 6, wherein the inner and outer windings have identical numbers of turns.

11. The method of claim 1, wherein the solenoid inductor is constructed as an integrated circuit device.

12. A solenoid inductor comprising:
an inner winding positioned substantially around a magnetic core;
an outer winding positioned substantially around the inner winding;
a first conducting layer processed as a bottom layer of the outer winding;
a first dielectric layer processed above the first conducting layer;
a second conducting layer processed above the first dielectric layer that is a bottom layer of the inner winding;
a second dielectric layer processed above the second conducting layer;
a magnetic core layer processed above the second dielectric layer;
a third dielectric layer processed above the magnetic core layer;

a third conducting layer processed above the third dielectric layer that is a top layer of the inner winding;

a fourth dielectric layer processed above the third conducting layer;

a fourth conducting layer processed above the fourth dielectric layer that is a top layer of the outer winding; and

a fifth dielectric layer processed above the fourth conducting layer;

wherein the inner and outer windings are electrically connected.

13. The solenoid inductor of claim 12, further comprising:

vertical conductors processed through the first, second, third and fourth dielectric layers to electrically connect the bottom and top layers of the outer winding; and

vertical conductors processed through the second and third dielectric layers to electrically connect the bottom and top layers of the inner winding.

14. The solenoid inductor of claim 13, further comprising:

for each conducting layer of the first, second, third and fourth conducting layers:

the conducting layer is separated into multiple conductors;

corresponding ones of the multiple conductors of the bottom and top layers of the outer winding are electrically connected to form corresponding turns of the outer winding; and

corresponding ones of the multiple conductors of the bottom and top layers of the inner winding are electrically connected to form corresponding turns of the inner winding.

15. The solenoid inductor of claim 12,

wherein the inner and outer windings are electrically connected serially to generate non-opposing magnetic fields in the magnetic core.

16. The solenoid inductor of claim 15, further comprising:

additional windings substantially positioned around the inner and outer windings using the layered process;

wherein each successive additional winding of the additional windings is substantially positioned around previous additional windings; and

wherein the inner and outer and additional windings are electrically connected serially and in a manner such as to generate non-opposing magnetic fields in the magnetic core.

17. The solenoid inductor of claim 12,

wherein the inner and outer windings are electrically connected to generate opposing magnetic fields in the magnetic core.

18. The solenoid inductor of claim 17,

wherein the inner and outer windings have different numbers of turns.

19. The solenoid inductor of claim 18,

wherein the different numbers of turns provide substantially matching respective inductance values of the inner and outer windings.

20. The solenoid inductor of claim 17, further comprising:

an even number of additional windings positioned substantially around the inner and outer windings using the layered process;

wherein each successive additional winding of the additional windings is substantially positioned around previous additional windings; and

wherein the inner and outer windings and additional windings are electrically connected in a manner such that an outer half of all the windings layers generate magnetic fields in the magnetic core that oppose magnetic fields generated in the magnetic core by an inner half of all the windings layers.

21. The solenoid inductor of claim 17,

wherein the inner and outer windings have identical numbers of turns.

22. The solenoid inductor of claim 12,

wherein the solenoid inductor is constructed as an integrated circuit device.