

# Euler's Mechanism for Amplification of Magnetic Field II

## (尤拉靜態 磁場增益技術 II)

(A mechanism to use the Parallel Path Technology for enhance of Magnetic field in the electromagnetic coil.)

Date : 06/05/06

Updated : 06/05/2006(7:50pm)

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### Background/Development of Idea:

Is there a way to further increase the effect of amplification of the electromagnet? In traditional Physics which use a solid iron core, the level of amplification is determined by the materialistic properties of the iron and the shape of it. Therefore it is impossible to do more amplification.

However, it is this inventor himself who discovered that the amplification of electromagnet could be explained in the framework of Parallel Path Technology. By understanding the reason and details of how this amplification happens, it becomes possible to further enhance the level of amplification of electromagnet.

### Summary & Discussion:

There are many ways to implement the following ideas. Essentially, the idea is to first break down into many concentric cylinder rings with slight gap between them ( $n_1$  layers): Divider. Then as Magnetic flux lines from the coil couple in each cylinder ring, the strength of the Magnetic flux lines in each individual ring is thus increased in accordance to Parallel Path Technology.

After the first strengthening process of the Magnetic flux lines took place in the rings, we then force the Magnetic flux lines from each ring to couple with other coming from a different ring. This effect is created by sealing the two ends of the first component of the iron core with another component of iron core which has the same diameter and same shape except lesser in total number of rings. i.e. More than one thinner ring from the middle is joined on two ends with a thicker ring. Since the second component has the same diameter and shape with the first component, therefore it is made of lesser number of individual rings. ( $n_2, n_2 < n_1$ ) The coupling of already coupled Magnetic flux line further strengthens the individual Magnetic flux line. This is thus the second strengthening process.

This cycle repeats itself until all Magnetic flux lines are joined in the last parts of this invention: A solid iron core, which all Magnetic flux lines from the rings are joined and coupled for one last time (Summarizer). A complete Magnetic circuit is made possible by connecting the last component of this iron core to two ends of the coil (Bridge). Alternatively, a complete Magnetic circuit could be made through the center of iron core where most of the Magnetic flux lines from the electromagnetic coil canceled out each other. In such a case, there would be two Magnetic circuits produced. One Magnetic circuit made of the electromagnetic coil and the component(s) of the iron core, another Magnetic circuit made of all the components including Summarizer and Divider.

Since the coupling of many Magnetic flux lines parallel to each other takes place more than one time, the resultant strength of each Magnetic flux line is greater than the existing core which all Magnetic flux lines are joined together in just one step.

One implementation of the above idea is made of 1<sup>st</sup> component consists of 4 rings, with two of 2<sup>nd</sup>

component each consists of 2 rings joined at two ends, and then two of 3<sup>rd</sup> components of solid iron core are again joined at two exterior ends of the two 2<sup>nd</sup> components. And all of the component has the same diameter of 4cm. And the 3<sup>rd</sup> components is joined with the bridge which to complete the Magnetic circuit from the electromagnet coil to the iron core. Assume for the sake of simplicity, we have only 12 Magnetic flux line each of the strength k produced by an electromagnetic coil. For the conventional iron core, the totality of the strength of Magnetic flux is therefore 144k. Now this Euler's Iron Core has replaced the conventional iron core in the same set of electromagnetic coil. For the sake of simplicity, we also assume in here that the Magnetic flux lines are distributed evenly between each ring. (In reality the density of Magnetic flux line are inversely proportional to the square of distance from the source.) Thus 3 Magnetic flux lines each of strength k is coupled in each ring of the 1<sup>st</sup> component, therefore at each ring we have the total of 9k strength of Magnetic flux. Then at two of 2<sup>nd</sup> component, coupling happen again which 2 of the same ring from the 1<sup>st</sup> component joined together in the two 2<sup>nd</sup> components, which now produce the totality of 324k strength of Magnetic flux in each ring. At the 3<sup>rd</sup> components, the process repeated and we finally have a Magnetic flux with the strength of 104976k. The enhancement ratio=  $10476k/144k=729=3^6$ .

Notice that the minimum number of component is two: One divider and One summarizer. The exact amplification depending on the configuration and arrangement of the rings. The above discussion has assume the iron core has no upper limit in amount and strength of the Magnetic flux line produced.

\*All 'coil' in above are refer to Electromagnetic coil.

\*\* Iron Core can also replaced by any ferromagnetic materials.

**Claim:** The system in its entirety with at least all its essential components each for the purpose stated above and together as a whole for the purpose of amplification of Magnetic field.

### **Related Claims:**

Parallel Path Technology(US Patent 6,246,561)

### **Applications:**

### **Advantages:**

1. Amplification of Magnetic field without the cost of extra electrical energy.

### **Technicalities:**

1. The effect of the Magnetic flux lines produced furthest from the coil is minimal on the components, but may not be completely neglect able.
2. The maximum amplification is limited by the physical properties of the iron core.