TITLE: ELECTROMAGNETIC ENERGY-FLUX REACTOR

BACKGROUND OF THE INVENTION

Field of invention

The present invention relates to a regenerative **electromagnetic energy-flux reactor (EER)** of high energy efficiency output utilizing alternating current source as excitation to create electromagnetic interaction into the reactor assembly to regenerate electromagnetic energy induced by the reactive coil to the regenerative coils, tuned by an electrical loads directly connected to the output of the collector coils. Maximum loading of the collector coils shall be with reference to the ratio of reactive to regenerative coils. The collector coils can be automatically tuned by a separate and distinct reactive reactor coil assembly (connected to one of the output of the reactive coils of the main assembly) for stable performance and maximum energy regeneration at the regenerative coils.

Description of the Prior Art

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The above listed patent describes and pertains to a technology where efficiency of the system are being enhanced or corrected to attain the desire maximization or energy conservation which totally differentiate this present technology which is the subject of this patent application. This EER (Electromagnetic Energy-flux Reactor) pertains to a technology that utilizes magnetism (permanent or electromagnetism) and varying magnetic fields to harness and harvest electromagnetic waves from the ambient sources to develop magnetic and electric fields which is responsible for the generation of **"Electricity."**

Definition of Electricity

To begin with, it will be useful to define and explain electricity and how it is being produced and harnessed.

"Electricity is defined as the electrical reaction of Atoms under heat or pressure and the resulting flow of electrical energy thru pathways of electrical resistance."

Electricity is not a substance and cannot be depleted nor can man create or destroyed it. However, it can be harnessed in several ways. AC electricity maybe of low or high voltage depending on the electrical systems or whatever network configurations may require. It can be a combination of both high and low voltage systems as in a system of generation, transmission and distribution. This complex set-up employs a transformer to step up voltage from the generation to the transmission side; step down the voltage from the transmission to the distribution side and finally step down from the distribution to the end user side. These transformation cycles of voltages and currents reduce the efficiency of the generation system due to the losses incurred during the process caused by the inherent impedances of various components in the system.

Objectives

The **primary objective** of this invention is to deliver higher energy output efficiency in conjunction with an alternating current source.

The **second objective** is to deliver energy conservation measures to all alternating current loads in nature and maximize the efficiency of the source.

The **third objective** is to make feasible the use of renewable energy which as of today are not being fully utilized due to

reason of too costly to implement, a limitation on location and a limitation of space.

The **fourth objective** is to enhance the performance power delivery system.

The **fifth objective** is to help the reduction of emission of ozone depleting substance in the atmosphere.

SUMMARY OF THE INVENTION

As explained earlier, EER is an assembly of one or more microprocessor-based power module (MPM), a single, two stage or more reactor system (RS) comprising of three (3) or more coils, a microprocessor-based control board (MCB) and a Hall Effect current sensors (HECS). The increase efficiency of the output is governed by the electrical load that is connected to the reactive coil assembly directly coupled or via a compensating reactor which regulates the voltage output of the EER. The emf and current that flows on the reactive coils inducts **electromagnetic energy** on the regenerative coil that produces magnetic fields on the reactor core opposite to the magnetic fields developed by the regenerative coil itself, (when excited by an excitation source). The opposing magnetic fields in the regenerative circuits exerted pressure on the atoms in the system to be in coherent state with one another. The coherent state of the atoms results in the continuous exchange of electrons flow between atoms by way of magnetic induction in the reactor system. Since electrons can hardly flow in the atmosphere due to high resistance of different kind of gases, they will be attracted to flow on the surface of conductors of

less resistance.

In EER the conductor of least resistance is the regenerative and reactive coils that will cause the electron to be attracted to this conductor giving rise to higher power output efficiency. As the electrical loads on the reactive circuits are increased, the magnitude of the **electromagnetic energy** in the regenerative circuits increases proportionally and the efficiency of the output delivered to electrical loads also increase.

A resultant increase in the electrical load capacity of the collector coil is also attained. The collector coils shall be loaded separately but shall be tuned according to the transformation ratio of reactive and regenerative coils. Further, the collector coils can be also excited by a **distinct reactive reactor independent of the main reactor** and connected in one of the output reactive coils of the main reactor assembly for auto tuning.

The HECS monitors the operating parameters of the reactor and activate and deactivate the system when it is within or beyond preset operating parameters. During the deactivation process the system will shift automatically to bypass mode. It has to be noted that the maximum loading capacity of the reactive, regenerative and collector circuit is limited by the design ratio and ampacity rating of the conductor coils.

To maximize design output ratio efficiency, a second stage reactor is integrated to regulate the desired voltage output for the electrical load. A minimum of two reactive coils maybe used to provide high intensity electromagnetic energy induction to the regenerative coils. The magnetic core of the EER shall be

made of thin film materials. Preferably the reactor system magnetic core shall be made of high grade silicon steel sheets grain oriented. The thickness of the plate of the grain oriented silicon steel sheets shall be of the thinnest available production size for better performance and efficiency. The stacking depth of the core area shall be of the maximum, based on design calculation to maximize the Casimir effect on the silicon laminated thin sheets. Copper conductor shall be 99.99% oxygen free and wound on the core for reactive, regenerative and collector coil. The **reactive, regenerative** and **collector** coil shall be wound separately with each other and altogether per leg of each reactor core. **Reactive**, regenerative and **collector** coil shall be of rectangular or round cross section copper magnet wire 99.9% oxygen free. The MPM and the MCM shall able to withstand a temperature rise of 65 degrees C. The construction of the reactor core shall be of the two legged R type core. The three legged shall be R type core also.

BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 is the block diagram of an **Electromagnetic Energy-Flux Reactor** assembly embodying the present invention; Fig. 2 is the circuit diagram of the integrated Microprocessor-based power Module (MPM 1 & 2), first and second stage reactor (R1 & R2), with **independent tuning reactive reactor** and Microprocessor-based Control Module (MCM), single phase, two stage Reactor assembly. Fig. 3 is the circuit diagram of the integrated Microprocessor-based power Module (MPM 1), first stage reactor (R1) and Microprocessor-based Control Module (MCM), **independent tuning reactive reactor** single phase, single stage reactor assembly.

Fig. 4 is the circuit diagram of the integrated Microprocessor-based Module (MPM 1& 2), first and second stage reactor compose of three sets per Stage (R1, R2, R3, R4, R5&R6) and a Microprocessor-based Control Module (MCM) three phase, three phase independent reactive reactor, two stage reactor assembly. Fig. 5 is the circuit diagram of the integrated Microprocessor-based Module (MPM 1), first stage reactor compose of three sets per Stage (R1, R2&R3) and a Microprocessor-based Control Module (MCM) three phase, single phase independent reactive reactor, single stage reactor assembly. Fig. 6 is an assembly of reactor showing how the reactive, regenerative, and collector coil are wound on a R type of core. The direction of the magnetic fields are also shown with respect both to their current develop in the regenerative coils. Fig. 7 is an alternative method of rewinding the reactive,

regenerative and collector coils.

Fig. 8 is an alternative method of rewinding the reactive, regenerative, and collector coil on a toroidal core assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 is a block diagram embodying the present invention comprising an exciter source 1, which excites the reactor 32 and 33 that serve as the source of power for the microprocessor-based power module 2 and 18, microprocessor- base control module 6 and at bypass mode. The microprocessor-base power module 2 and 18 drive the control circuit of the auxiliary switching module 24 and 23 as indicated in Fig. 4. These microprocessor-based power module 2 and 18 are controlled and actuated by the microprocessor-based control module 6 receiving signal from the Hall Effect current sensor 11. Fig.2, the exciter source 1 supplies the power requirement of the microprocessor- based power module 2 and 18 and the microprocessor-based control module 6. At zero electrical load at terminal 15, the Hall Effect current sensor 11 senses zero current and send a signal to the microprocessor- based control module 6. The microprocessor-base control module 6 will process the signal and actuate, relay the process signal to microprocessor-base power module 2 & 18 via control cable 8 and 10 as in Fig. 2. The microprocessor-based power module 2 and 18 will deactivate the reactor 32 and 33. In Fig.4, the exciter source 1 supplies power to the microprocessor-based power module 2 and 18 and the microprocessor-base control

module 6. At zero electrical load at the terminal 15, 16, and 19 the Hall Effect current sensor 11 senses zero current and sends a signal to the microprocessor-based control module 6. The microprocessor-based control module 6 will process the signal and actuate, relay the process signal to the microprocessor-based power module 2 and 18. The microprocessor-base power module 2 and 18 will process the receive signal and activate the auxiliary switching module 24 and 23. The auxiliary switching module 24 and 23 will deactivate reactors 32 and 33. Upon switching a load on terminal 15 as in the case of Fig. 2 and terminal 15, 16 and 19 as in the case of Fig.4, the Hall Effect current sensor 11 will send the signal to the microprocessor-base control module 6. The microprocessor-base control module 6 will receive and process the signal sent by Hall Effect current sensor 11. If the signal sent by the Hall Effect current sensor 11 is equal or above the preset minimum current triggering signal, the microprocessor-based control module 6 will relay the process signal to the microprocessor-based power module 2 and 18. In Fig. 2 the microprocessor-based power module will activate reactors 32 and 33. In Fig. 4 the microprocessor-based power module 2 and 18 will relay the processed signal to the auxiliary switching modules 24 and 23. The auxiliary switching module 24 and 23 will deactivate the bypass mode and at the same time activate reactors 32 & 33. When reactors 32 and 33 are energized, an electromagnetic energy and magnetic fields of opposite direction and an exciting current 27 that creates the counter opposing fields 28 are developed at the regenerative circuit 4 (as in Fig. 2) 4A, 4B and 4C (as in Fig.

4). Almost at the same time a current flow at regenerative coil 3 (as in Fig. 2) and 3A, 3B and 3C (as in Fig. 4) develop a feedback current 29 and a counter opposing magnetic field 30 (as shown in Fig. 6) to the regenerative coil 4 (as in Fig. 2) and 4A, 4B and 4C (as in Fig. 4) directly in opposition to the magnetic fields 28. Both the exciting current 27 and feedback current 29 (as shown in Figure 6), in Fig. 2 and Fig. 4 are in collision thus pressuring the atoms in the system to be cohesive with one another. The cohesion state of the atoms gives rise to the exchange of electron between atoms resulting in the continuous flow of electrons in the regenerative circuit and dissipated to the electrical loads. Since electrons can hardly flow in space due to the high resistance of the gases in the atmosphere, it will be attracted to a path of less resistance. In the **Electromagnetic Energy-flux Reactor** the reactive coil 3 and the regenerative coil 4 (as in Fig. 2), and the reactive coil 3A, 3B and 3C and the regenerative coil 4A, 4B and 4C (as in Fig. 4) is the electrical path of less resistance and electrons will be attracted to their conductor coils. As long as the exciter source 1 continuously supplies the needed excitation voltage and current, the cohesion of atoms through magnetic induction will continue. The collector coil 5 (as in Fig.2) and 5A, 5B and 5C (as in Fig. 4) will be electrically loaded to increase the intensity of the counter opposing magnetic fields 28 in the regenerative coil 4 (as in Fig. 2) and 4A, 4B and 4C (as in Fig.4) as the regenerative coil 3 (as in Fig. 2) and 3A, 3B and 3C (as in Fig. 4). This is to maintain or increase the atom cohesive strength developed in the reactor system.

The microprocessor-based power module 18, control and adjusts the ratio of reactor 33 with respect to regenerative coil 12 with13 (as in Fig. 2) and regenerative coil 12A, 12B, 12C with 13A, 13B, 13C (as in Fig. 4) via the auxiliary switching module 23, to regulate the voltage output at terminal 15, 16 and 17 (as in Fig. 2) and 15, 16, 19, 20, 21 and 22 (as in Fig. 4). The single phase output for Fig.2 line to line are terminals 15 and 16, line to ground are terminals 15 and 35, 16 and 35 and 17 and 35. The three phased output terminals for Fig. 4 are 15, 16, 19 respectively and 20, 21, 22 respectively. The collector coil 14 (as in Fig. 2) and the 14A, 14B, and 14C as (in Fig. 4) are utilized to maximize the output load of the magnetic induction atoms cohesion reactor system. A **separate and distinct reactive reactor coil assembly** can be introduced to excite the collector coils for self tuning instead of loading it with electrical loads. This **reactive reactor coil assembly** is connected at one of the output of the main reactor reactive coil.

CLAIMS

I claim the following:

1. An assembly of an **ELECTROMAGNETIC ENERGY-FLUX REACTOR (EER)** including:

   a. An external exciter input source (utility grid, power plants such as hydroelectric, thermal, nuclear and geothermal, wind generator, fuel cell generator, solar power generation and tidal power generation).

   b. An auxiliary switching modules that deactivates and activates the reactor whether a single or double staged system single phase and three phase system.

   c. A microprocessor-based power module that controls the auxiliary switching module.

   d. A microprocessor-based control module that process the signal feed by the hall effect current sensors.

   e. Hall Effect current sensors for single or double stage as in the case of Fig. 2 & 3 and single or double as in the case of Fig. 4 & 5, that senses the output current of the output electrical load of the system.

   f. A system of one or more electromagnetic reactor whether single or two stage comprising of the following coils:

      I. A **reactive inductive coil** for the induction of electromagnetic energy and induced an opposing magnetic
      fields at the regenerative coil.

      II. A **regenerative inductive coil** that absorbs the

electromagnetic energy and magnetic fields induced by the reactive coil. This coil by itself produces magnetic fields opposing the direction of the magnetic fields induced by the reactive coil assembly when excited by an external source.

III. A **collector inductive coil** to increase of intensity of a magnetic field in the regenerative circuit when loaded separately by an electrical load tuned to the ratio of reactive and regenerative coil or to be excited by a separate and **distinct separate reactive reactor** (connected in one of the output of the main reactive coil) for auto tuning of the main reactor without the benefit of external electrical load connected to the collector coil.

IV. An **independent reactive inductive coil assembly** which induces excitation current and voltage to the collector coil of the main reactor for increase magnetic fields at the regenerative circuit of the main reactor and for auto tuning of the main reactor assembly.

V. A **compensating reactor** to regulate the voltage output of the system.

2. The **Electromagnetic Energy-Flux Reactor** according to **Claim 1** wherein the microprocessor-base control module receives the signal via the Hall Effect current sensors, process the signal, activates the microprocessor-base power module, and relays the process signal to deactivate or activate the reactor system in the case of Fig.2., or control the operation of

the auxiliary switching module whether to deactivate or activate the reactor systems based on the signal feed via the Hall Effect current sensors as process by the microprocessor-based control module and relay the processed signal to microprocessor-based power module in the case of Fig. 4.

3. The **Electromagnetic Energy-Flux Reactor** according to **Claim 2** that deactivate the reactor system once the level of current sense via the Hall Effect current sensor at the output or load side falls below the level of the preset minimum current signal.
Activate the reactor system once the Hall Effect current sensor senses a current above the minimum preset current signal and within the boundary or equal to the maximum preset current signal.

4. The **Electromagnetic Energy-Flux Reactor** according to **Claim 2** that deactivates the reactor system once the hall effect current sensors sense a current signal beyond or over the preset maximum current level signal and switch back the system to bypass mode.

5. The Electromagnetic Energy-Flux Reactor according to Claim 1 that produces two opposing magnetic fields at the regenerative circuits when loaded at the output terminals of the reactive and collector coils or when the collector coils is excited by a **separate distinct reactive reactor** assembly for self tuning, resulting in the increase intensity of the opposing magnetic

fields and the collision of current, forcing the atoms in the system to be in cohesion. The cohesion process enables the exchange of electrons between atoms resulting in the continuous flow of electrons thru the reactive and regenerative coils and absorbed by the connected electrical loads as long as the regenerative coils are excited.

6. The **Electromagnetic Energy-Flux Reactor** according to **Claim 1** that may comprise only of one reactor assembly which may be configure to have similar effect to Claim 5 if loaded on the output and the collector coil independently.

7. The **Electromagnetic Energy-Flux Reactor** according to **Claim 1, 5 and 6** that utilizes electromagnetic induction theory to regenerate sizable energy magnitude at the regenerative coils by means of induced emf and current of the reactive coils and the increase intensity of the magnetic fields at the regenerative circuits brought about by the tuned load of the collector coils. The magnitude of regenerated energy at the regenerative coils is according to the design ratio of reactive to regenerative and regenerative to reactive coils.

8. The **Electromagnetic Energy-Flux Reactor** according to **Claim 1, 5, 6 and 7** that utilizes electromagnetic induction theory to regenerate sizeable energy magnitude at the regenerative coils by means of induced emf and current of the reactive coils and the excitation of the collector coils by means of a **separate and distinct reactive reactor assembly**

(connected to one of the output of the reactive circuits). The excitation energy of the separate and distinct reactive assembly increases the intensity of the opposing magnetic fields induced by the reactive coils of the main reactor at the regenerative circuits. The reactive reactor assembly induced automatic tuning of the main reactor assembly. The magnitude of regenerated energy at the regenerative coils is according to the design ratio of reactive to regenerative and regenerative to reactive coils.

9. The **Electromagnetic Energy-Flux Reactor** according to **Claim 1, 5, 6, 7 and 8** that when installed and excited with an alternating current source delivers energy to AC load banks (whether resistive, inductive or rectifier assembly), regenerates energy of sizable magnitude according to the design ratio of reactive to regenerative and regenerative to collector coils.

10. The **Electromagnetic Energy-Flux Reactor** according to **Claim 1, 5, 6, 7 and 8** that when excited from an inverter (input dc source of the inverter coming from renewable energy sources like wind, solar, fuel cell and other forms of DC sources or even on all types of batteries and battery banks) of alternating current waveform output delivers energy to AC load banks (whether resistive, inductive or rectifier assembly), regenerates energy of sizable magnitude according to the design ratio of reactive to regenerative and regenerative to collector coils. Please see illustrative example of the actual prototype test result below accompanied by simple formula.

$$P(in) = P(out) + P(sys) - P(reg) \quad \text{eq. 1}$$

$$P(reg) = P(rea) + P(rea\text{-}sr) \quad \text{eq. 2}$$

$$P(rea) = \{(N(rea)/N(reg)) \times V(rea) \times I(L) \times p.f\} \quad \text{eq. 3}$$

$$P(rea\text{-}sr) = \{(N(col)/N(rea\text{-}sr)) \times V(rea\text{-}sr) \times I(L) \times p.f\} \quad \text{eq.4}$$

$$P(in) = P(out) + P(sys) - [\{(N(rea)/N(reg)) \times V(rea) \times I(L) \times p.f\} + \{(N(col)/N(rea\text{-}sr)) \times V(rea\text{-}sr) \times I(L) \times p.f\}] \quad \text{eq. 5}$$

P(in) - Power input to the EER

P(out) - Power output dissipated to the electrical loads

P(reg) - Power regenerated to the regenerative circuits

P(rea) - Power induced by the reactive circuits to the regenerative circuits

P(rea-sr)- Power dissipated by the separate and distinct reactor as excitation of the collector coils of the main assembly

P(sys) - Power dissipated by system losses

N(rea) - Number of turns of reactive coil

N(reg) - Number of turns of regenerative coils

N(col) - Number of turns of collector coils

N(rea-sr)- Number of turns of separate reactive reactor

I(L) - Load current of the connected load of the EER

p.f - power factor of the connected load of the EER

V(rea) - Voltage drop at the reactive coil

V(rea-sr)- Voltage drop at separate reactive reactor reactive coils

Note: the volts per turn of the main reactor and the separate and distinct reactive reactor assembly shall be the same.

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