

Semi Rotational DC Transformer - Patent Offer

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Claims:-

[Claim 1] A semi-rotational DC voltage transformer consisting of a secondary core and a primary core around which a rotating part rotates. The rotating part rotates around the primary core, which is wound with copper coils and passes a DC voltage; it is not a stationary primary core like other transformers. This is done to cut and rotate the constant/DC magnetic field associated with the constant/DC voltage, so that it becomes a rotating field inside the transformer. This rotating part is similar to an electric motor. It is a motor that moves a base (rotationally or vertically on the x-axis) with magnetic poles attached to it, which cut and rotate the constant DC field. It is possible for it to move without electricity, as there are fan blades installed in the transformer moving part and connected to the rotating part of the transformer to use air to move it if it is in open spaces exposed to air, or water to move it as in dams. The invention here works as an electric generator and an electrical transformer simultaneously, or it uses electricity from an external source to move the rotating part, such as solar energy, for example. The transformer also contains auxiliary elements in this invention, such as a superconducting fault current limiter to protect it from short circuit currents and inrush currents. It also includes a rectifier, which is a rectifier circuit consisting of several diode units to convert the AC output to DC output when needed. It also contains a surge arrester to protect the transformer from discharge voltages. Other than these important components, the DC transformer contains all the protection and measurement units that any other transformer contains, such as a current transformer (CT), a voltage transformer (PT), silica gel, a cooling medium, whether mineral oil, air, nitrogen, or any other type of cooling medium depending on the voltage used with the transformer, a Buchholz relay, and so on.

[Claim 2] A semi-rotational DC voltage transformer, as mentioned in the first item, contains a rotating part around the primary core coils. This part is a circular base on which magnetic poles are fixed, producing a rotating magnetic field that cuts the stationary DC magnetic field associated with the DC voltage, transforming it into a rotating magnetic field inside the transformer. This allows the voltage to be changed and transferred from the primary core to the secondary core, like any normal electrical transformer.

[Claim 3] A semi-rotational DC voltage transformer, as mentioned in the first item, provides an output in the form of a direct voltage or an alternating voltage, depending on the need. The output of the DC voltage transformer is an alternating voltage, and a current rectifier can be installed to obtain a direct voltage.

[Claim 4] A semi-rotational DC voltage transformer, as mentioned in the first element, can rotate horizontally or vertically to generate a rotating magnetic field that cuts the fixed DC magnetic field, allowing the DC voltage to be converted and transmitted within the transformer. It can move without electricity, as there are fan blades installed in the transformer and connected to the rotating part of the transformer to use air to move it if it is in open spaces exposed to air, or use water to move it as in dams. The invention here works as an electric generator and an electric converter at the same time, or uses electricity from an external source to move the rotating part, such as solar energy, for example.

[Claim 5] A semi-rotational DC transformer, as mentioned in the first item, is not affected by short circuit currents or inrush currents, which prevents the malfunction of protection devices and reduces the risk of transformer fires. This is because the transformer contains a superconducting fault current limiter, which is a resistance with a zero value during operation and a maximum value when short circuits or surge currents occur.

[Claim 6] A semi-rotational DC voltage transformer, as mentioned in the first item, is not exposed to the problems of discharge voltages or voltages/overvoltage exceeding the rated voltage value of the transformer, as it contains a surge arrester to protect the transformer from discharge voltages. Other than these important elements, the DC voltage transformer contains all the protection and measurement units that any other transformer contains, such as a current transformer (CT), a voltage transformer (PT), silica gel, a cooling medium, whether mineral oil, air, nitrogen, or any type of cooling medium according to the voltage used with the transformer, a Buchholz relay, and so on.

Detailed Description:-

[1] A semi-rotational DC transformer converts DC voltage from one value to another by converting DC voltage to AC voltage inside the transformer itself so that the voltage value can be changed. The concept is similar to the DC motor operation philosophy, which is converting DC to AC inside the motor coils by means of a commutator and carbon brushes to rotate. The transformer in this invention also converts DC to AC with a rotating magnetic field whose voltage value can be changed. In this invention, we find that it consists of an AC transformer along with

parts/components for converting DC to AC and other components for the purpose of protecting the transformer and converting the transformer output from AC to DC when necessary.

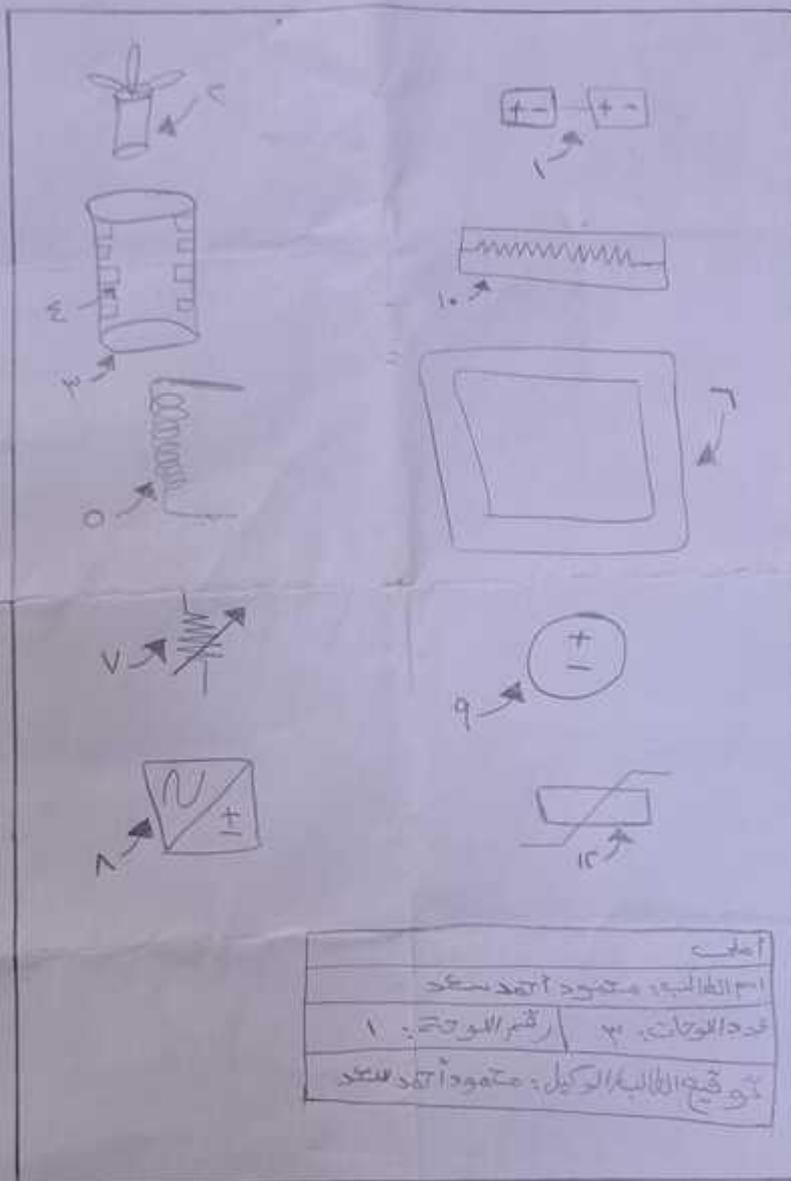
[2] To explain the components of the transformer that allow converting/transforming direct current to alternating current, we find that it consists of a rotating part, such as the rotor of a motor, with a set of magnetic poles that generate a rotating magnetic field that cuts the constant/direct magnetic field associated with the direct voltage of the system whose voltage is to be transferred. This rotating part is, of course, fixed around the primary windings of the transformer only. The rotating part is connected to an external voltage source and a motor that moves the rotating part, or a turbine with blades/fans is installed, such as those used in wind energy, for the purpose of utilizing the wind or flowing water in dams, for example, to move the turbine that is connected to the rotating part to move it with clean energy and also to generate electricity, as there is a motor installed between the turbine and the rotating part. In this case, the motor works as a generator and produces electricity. Another important component is the superconducting fault current limiter, which performs two important functions: First: It protects the transformer from short-circuit currents by reducing the short-circuit current to the lowest possible value, thus minimizing its harmful effect on the transformer, allowing the protection devices to disconnect the short-circuit current. Second: It protects the transformer from inrush currents that arise when the transformer starts up, sometimes reaching 10 times the original current value. This component is connected in series with the DC voltage source and before the transformer.

[3] A direct voltage is connected to both ends of the primary coil of the semi-rotating transformer in order to change the voltage value for different uses, including the transmission and distribution of electricity, according to the famous mathematical equation: Transformation ratio = Primary coil voltage to Secondary coil voltage = Number of turns of the primary coil to Number of turns of the secondary coil. The rotor, which carries magnetic poles, rotates by a motor operated from an external voltage source. The rotor rotates around the transformer coils through which a direct voltage passes, creating a rotating magnetic field due to the magnetic poles. This works to cut the direct field into an alternating/rotating field with a rotating/rotating voltage that magnetizes the iron core of the transformer. The new alternating voltage is transmitted to the two ends of the secondary coil of the transformer, and a new alternating voltage is generated on both ends with a new value, according to the aforementioned mathematical equation. The transformer output is an alternating voltage. If the output needs to be a constant/direct voltage, a voltage rectifier is installed, which is a network of diode units.

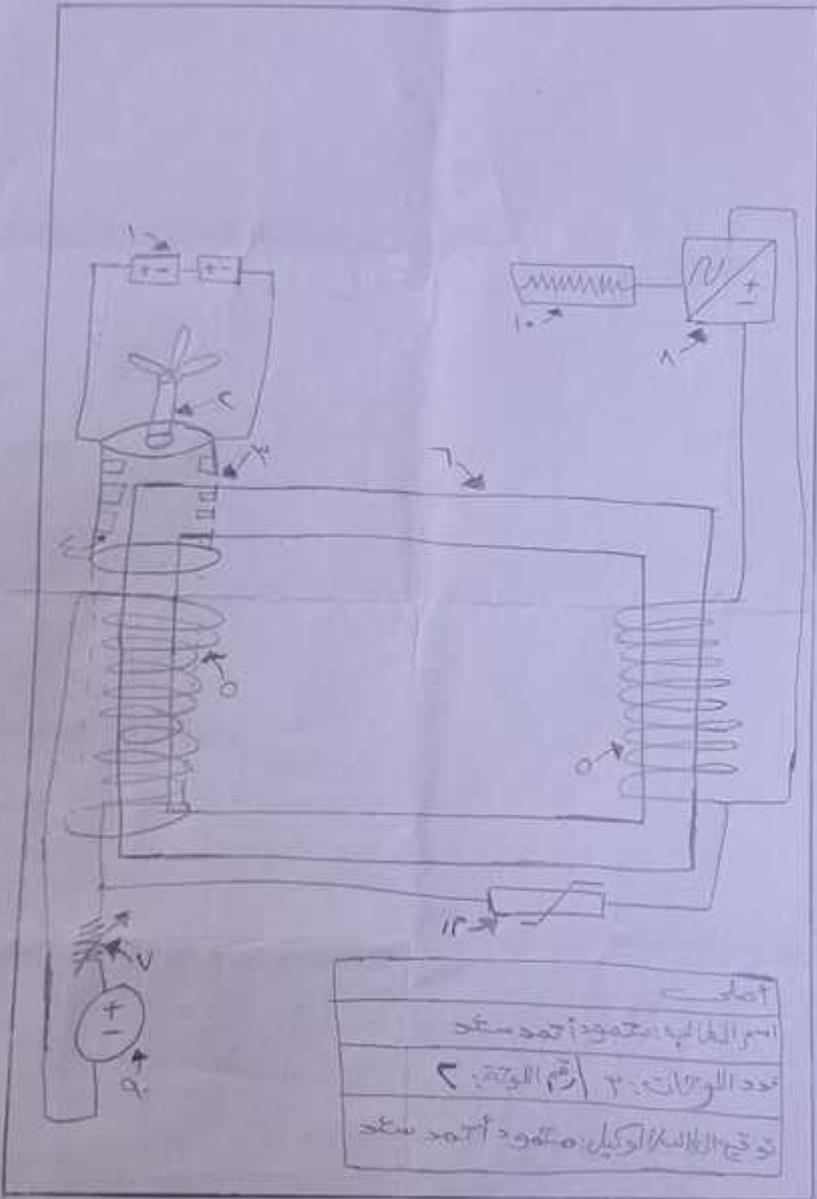
It works to convert the alternating current to direct current, which is then transmitted to the load. The surge arrester is connected in parallel with the transformer to protect it from voltage surges or high voltage discharges associated with electrical faults.

[4] The rotor is connected to an external voltage source and a motor that drives the rotor or a turbine with blades/fans is installed such as those used in wind energy for example to utilize the wind or water flowing in dams to drive the turbine connected to the rotor to move it with clean energy and to generate electricity. It also contains the rest of the transformer's auxiliary elements such as silica gel and the constant voltage transformer which contains all the protection and measurement units that any other transformer contains such as the current transformer (CT), the voltage transformer (PT), the cooling medium whether mineral oil, air, nitrogen or any other type of cooling medium depending on the voltage used with the transformer and the Buchholz relay etc.

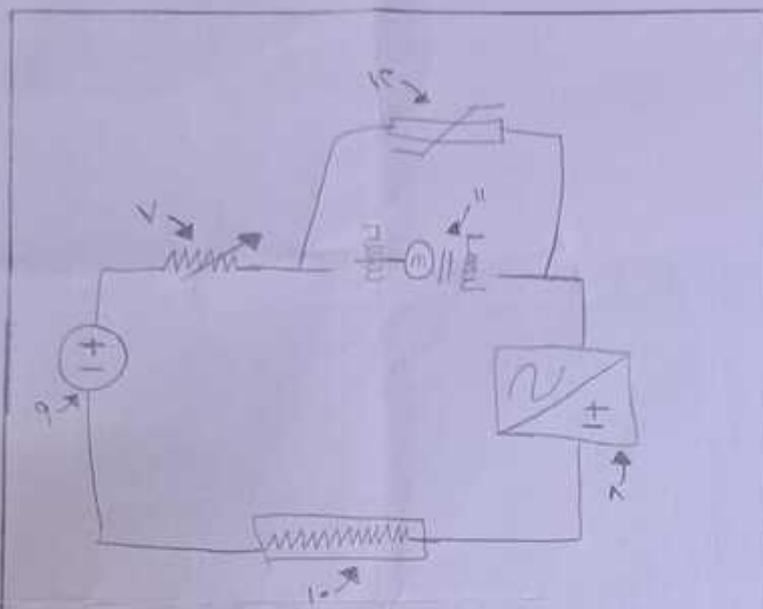
Drawings:-



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