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PATENT OF INVENTION

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A Direct Current Rotational Machine without a Commutator

Abstract: A direct current rotational machine, and for alternating current through conversion, without a commutator or brush system, according to the invention, with the scope of simplifying the construction and to improve the machines efficiency, it is designed to be composed of three or more modules (motor elements) noted by the letters R S T, every module being constructed, to be functional, by itself or in assembly, the modules being assembled on the same rotational axle and being sheltered under the same common case.

The invention refers to a rotational electric motor, supplied with DC electrical energy, taken from electrical batteries (car batteries) , or from the public or industrial power grid of AC currents.

This type of original motor can be used in all activities where the classic

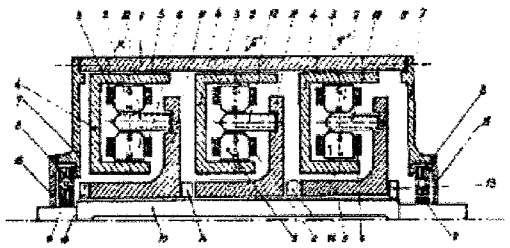

Fig. 1

motors are now used, of either DC or AC type.

There are known rotational electric machines (motors) for DC or AC currents, single phase, or double phase, which for developing mechanical work have the rotor coils wound with electrical conductors which, in general, are made of copper, the ends of the coils being welded to the commutator segments on which slide the carbon brushes with the purpose of transmitting the necessary electric current to the

coils, for the purpose of creating the rotor magnetic field.

The objective of the invention is simplifying it's manufacture, with the objective to reduce raw materials and labor, the complete elimination of the rotor coils, of the commutator and brush system, and in addition to realize certain savings in energy consumption, when these machines are used in domestic or industrial activities.

The rotational electric machine, according to the invention, eliminates the rotor coils, the commutator and the brush system, which represents a significant economic disadvantage for currently manufactured machines.

The rotational electric machine, for DC current, according to the invention, eliminates the previously mentioned disadvantages, through the fact that it is designed with external electromagnets, fixed to the case/stator, and with interior electromagnets, fixed to the yokes which close the magnetic flux lines. Between the exterior and the interior electromagnets, resides a magnetic conductor ring which replaces the electric conductors. The magnetic conductors are made from silicate materials (or steels) or from ferrites.

The exterior and interior electromagnets are excited by the excitation coils, realized by winding on these pole pieces; these windings being fed with DC electric energy obtained from a battery or from the public or industrial grid, of alternating current converted to direct current.

The application of this invention produces the following advantages:

- simplified manufacturing process due to lower time requirements;
- economy of copper due to the elimination of rotor coils and the commutator
- can be used in a gaseous, explosive environment, due to the elimination of the commutator and the brush system.
- the reduction in electric energy consumption, due to the concept of using magnetic conductors instead of electric conductors, and due to the fact that for these new motors the calculation of energy in watts is no longer based on the multiplication of voltage times current ($P = V \times I$), this formula being replaced with the notion that the magneto-motor force has a basis in the magnetic induction created by the magnetic flux lines applied to the pole surfaces.

Now, in continuation, an example is presented on how to realize the invention, referring to fig. 1 and 2, which represent:

- fig.1, longitudinal section through the whole assembly
- fig. 2, which defines the transverse sections through the modules R, S, T, which are offset by 120 deg.

The rotational electric machine, for DC current, without a commutator, according to the invention, is composed from three modules noted by the letters "R", "S", and "T", every module being composed of two halves, in a semi disc shape, coupled mechanically to each other, having the coils connected in series, or parallel, or mixed, per application. The polar pieces are offset from each other at 120 degrees, every one of the three rotors being able to rotate between the attractive or repulsive magnetic field flux, created by the modules "R", "S", and "T".

This rotational electric machine, for DC current, according to the invention, it is composed of case **1**, which hold together the whole assembly composed of the exterior polar pieces **2**, on which the excitation windings **3** are

situated, the yoke **4** for the closure of the magnetic flux lines between the polar pieces **2** and the interior polar pieces **5** excited by coil **6**. The shields **7**, along with the bearings **8**, and the bearing races **9** , form the bearing and protection system for the axle **10**, on which the rotors **11** are fixed, which will support the magnetic conductors **12**, the rotor rigidity being facilitated by washers **13**, and spacers **14**, and caps **15** protecting the bearing system.

CLAIMS

1. A rotational machine activated by direct current and alternating current, through conversion, without a commutator or brush system, according to the invention, for the purpose of improved machine efficiency and simplified construction, and characterized by the fact that it designed to have 3 or more modules (motor elements) noted by letters "R" "S" and "T", every module being functional by itself or in assembly, and being assembled on the same rotational axle and housed under the same common case.

2. A rotational machine activated by direct current, without a commutator, like in claim 1, characterized by the fact that, with the scope of creating an original rotational machine, and keeping in mind the economy of copper and electrical energy, uses metallic magnetic flux conductors, with the help of which a mechanical force is developed through the closure of the magnetic flux lines, in attraction or repulsion, between the internal and external poles pieces.

3. A rotational machine, like in claim 1 and 2, composed of stator case **1**, exterior pole pieces **2** on which is found the excitation coil **3**, yoke **4** necessary for the closure of the magnetic flux lines, and the inferior (interior) pole pieces **5**, excited by coils **6**, shields **7** with bearings **8** and races **9**, forming the protection and the bearing system for the rotational axle **10** on which is affixed the rotors **11** on which is affixed the magnetic conductors **12**, the system for creating a rigid structure being formed from washers **13** spacers **14**, caps 15 protecting the bearing system.

4. A rotational machine, like in claim 1, 2, and 3, characterized by the fact that, it can be composed of three or more modules (motor elements) having an angular position offset equal to 120 degrees.

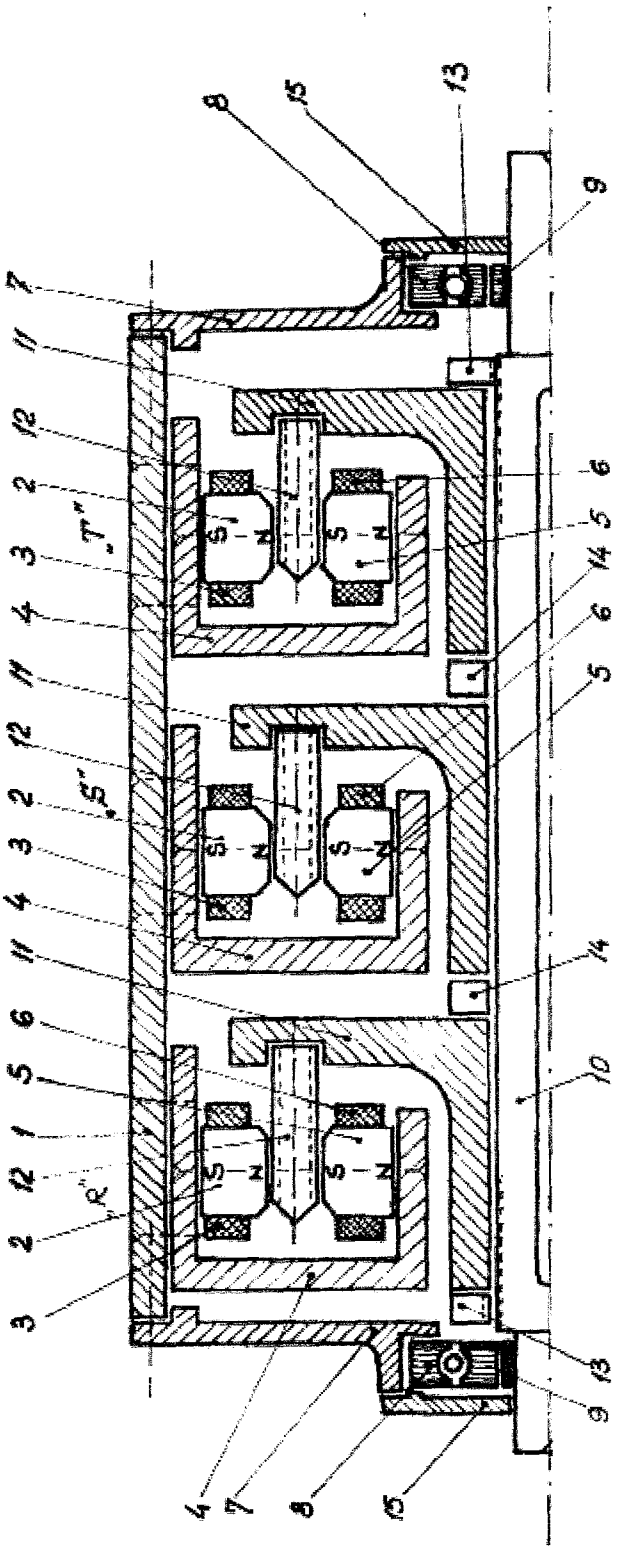

Fig.1

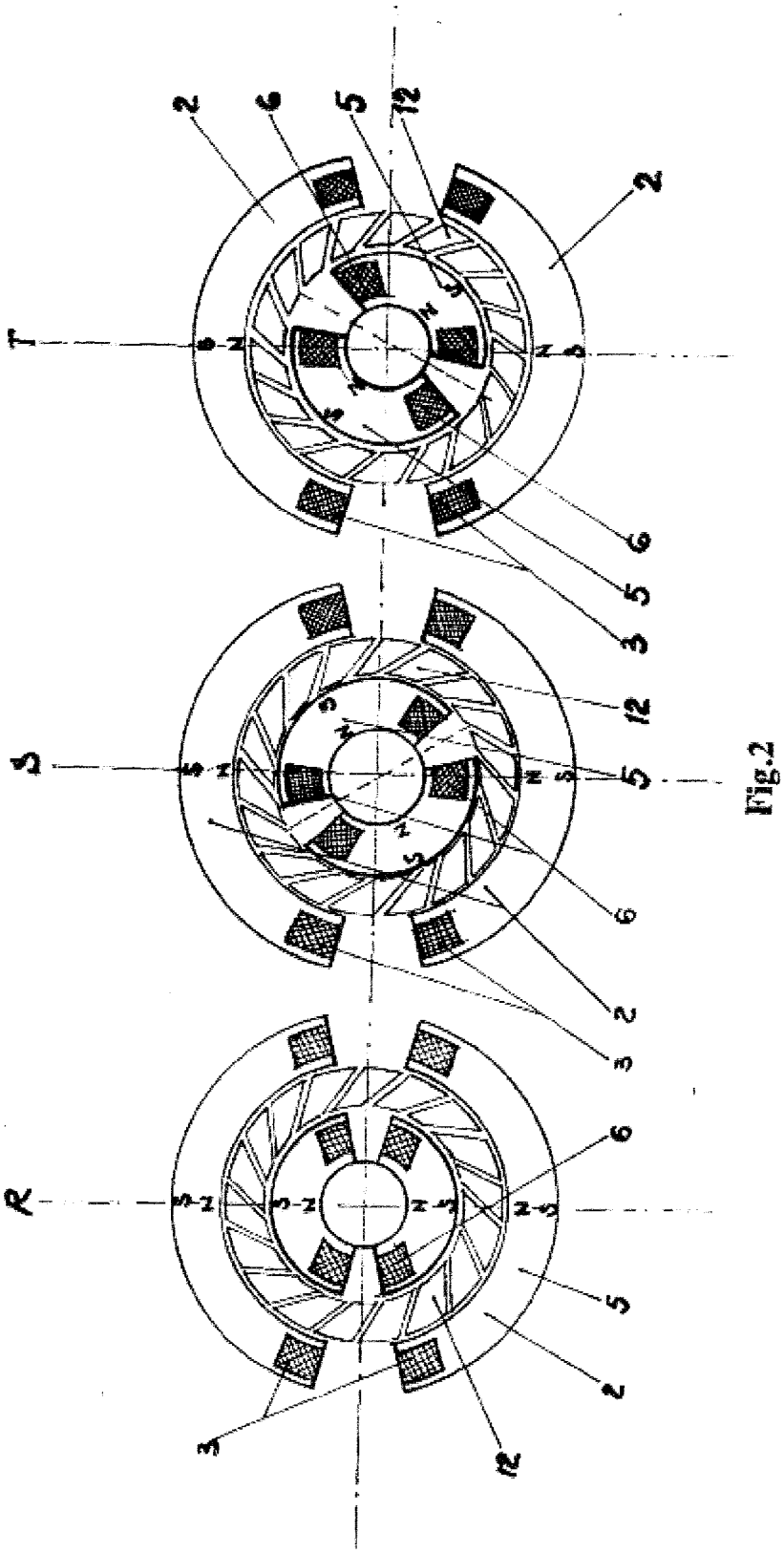

Fig.2