THE MOTOR-GENERATOR

Ph.M. Kanarev, S.B. Zatsarinin

Announcement. The test results of the first model of a motor-generator are a simple and convincing proof of erroneousness of the first Newton law and existing electrodynamics.

The Video about motor-generator is to address:
http://pesn.com/2010/10/13/9501712_Kanarev_announces_self-running_motor-generator/

MG-1 motor-generator has a conventional rotor and a conventional stator. In it, the rotor plays the role of the motor, and the stator plays the role of the generator (Fig. 1). Nearly 100 years were necessary in order to understand how to make the generator rotor rotate without an exterior drive [1], [2].

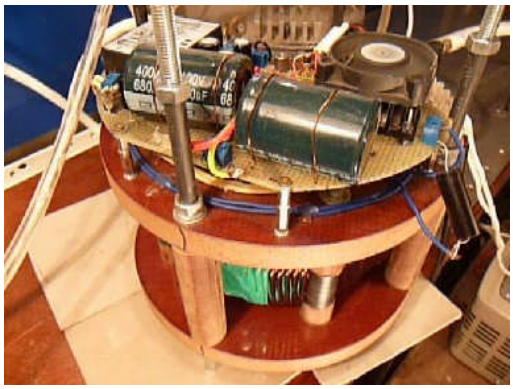


Fig. 1. Photo of MG-1 motor-generator

The tests of the first model of MG-1 started in the beginning of June, 2010, and go on up to date. The results being obtained are specified in the article "Power balance of the motor-generator", but it cannot be published completely now as it contains too much information, which belong to the category of commercial secrets. That's why we publish the generalized items of this article.

First of all, let us consider MG-1 power balance in idle run. A theoretical structure of this balance is given in Fig. 2.

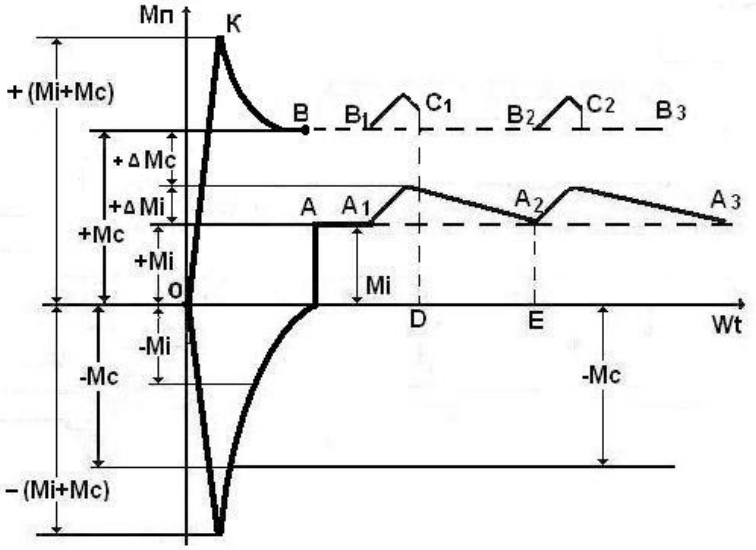


Fig. 2. Diagram of a change of the torques influencing the MG-1 rotor when it starts its operation as well as in case of uniform rotation

At the moment of the rotor rotation start, its starting torque $M_{ї}$ overcomes resistance in the form of the moments of mechanical resistances and working resistances $-M_C$ and in the form of inertial torque $-Mi$. The amount of these resistances is $-(Mi + M_C)$ (Fig. 2). When the rotor starts its uniform rotation, inertial torque becomes positive $+Mi$ and does not resist rotation of the rotor; it favours its uniform rotation (Fig. 2). Workload and the mechanical resistances and aerodynamic resistances $-M_C$ resist uniform rotation of the rotor [3]. An oscillogram of the voltage and current pulses of voltage and current at the time of the rotor rotation start, which is given in Fig. 3, proves it. It has been written with resistance of 0.1 Ohm. It means that 0.5/01.=5 A at one division of the oscillogram.

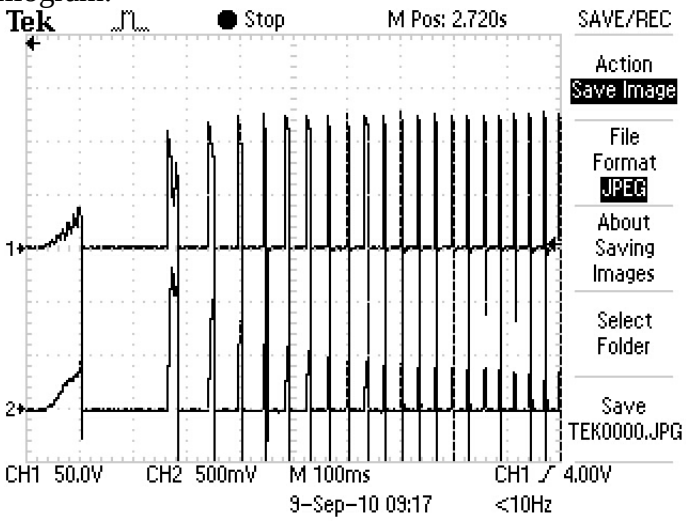


Fig. 3. Oscillogram of the starting values of voltage and current of the excitation winding of the rotor with the flywheel

Amplitude of the first current pulse is more than 13 A. It exceeds average amplitude 3fold, and it is natural, because not only mechanical moments $-M_C$, but inertial torque $-M_i$ as well resists rotor rotation at this moment (Fig. 2). An analysis of the oscillogram in Fig. 3 shows that the values of the current pulse amplitudes become equal nearly after the 20th pulse. It means that the uniform rotation of the rotor begins after the 20th pulse. In Fig. 2, the moment when inertial torque becomes positive $+M_i$ corresponds to point B. Amplitude of the first voltage pulse is more than 120 V, and amplitude of the first current pulse is 13 A (Fig. 3). It means that starting pulse power is 120x13=1560 W. It is used to overcome inertial torque $-M_i$ and is taken from the primary energy source only once, at the time when the rotor starts operating; that's why it is not taken into consideration in MG-1 power balance, which is realized within many hours of its operation.

As inertial torque of the rotor takes part in the process of its start, it is necessary to know its value. First of all, it is necessary to determine kinetic energy of the rotor, which rotates uniformly, and mechanical power at its shaft in case of this rotation [3].

A connection between kinetic energy E_K of a body, which moves uniformly, and its power P appears from work being performed during its uniform motion per second [3].

$$P = \frac{E_K}{t} = \frac{mV^2}{2t} \Rightarrow \frac{mV}{2} \cdot \frac{V}{t} \Rightarrow \frac{mV}{2} \cdot a \Rightarrow \frac{ma}{2} \cdot V \Rightarrow \frac{kg \cdot m}{s^2} \cdot \frac{m}{s} \Rightarrow$$
$$\Rightarrow \frac{9.80}{2} \cdot F \cdot V \frac{N \cdot m}{s} \rightarrow Watt \qquad (1)$$

A connection between kinetic energy E_K of a body, which rotates uniformly, and its power P appears from work being performed by it during its uniform rotation per second [3].

$$P = \frac{E_K}{t} = \frac{I_i\omega^2}{2t} \Rightarrow \frac{I_i\omega}{2}\cdot\frac{\omega}{t} \Rightarrow \frac{m\cdot r^2\omega}{2}\cdot\varepsilon \Rightarrow \frac{I_i\varepsilon}{2}\cdot\omega \Rightarrow \frac{kg\cdot m^2}{s^2}\cdot\frac{1}{s} \Rightarrow$$
$$\Rightarrow \frac{9.80}{2}\cdot M_i\cdot\omega\frac{N\cdot m}{s} \rightarrow Watt \qquad (2)$$

Thus, a numeric value of kinetic energy of the rotor, which rotates uniformly, is equal to mechanical power on its shaft. A physical essence of the mathematical transformations (2) being performed by us can be described as follows. As the rotor rotates uniformly, it is necessary to divide its kinetic energy E_K by time t in order to determine mechanical power P hidden in its rotation. In each second, a rotating motion of the rotor performs work, which is expressed in joules (J). It means that its mechanical power is equal to a value of kinetic energy E_K divided by second J/s=W. It is always present at the rotor shaft during its rotation with constant velocity. This presence is implemented by a value of inertial torque $\grave{I}_i$.

It appears from the first Newton law that when the body rotates uniformly, no forces or moments of forces operate on it. It is equal to a negation of inertial torque $\grave{I}_i$ at the rotor shaft during its uniform rotation [3]. In order to see erroneousness of this negation, let us determine a value of inertial torque at the shaft of MG-1 rotor. One should take into account that a value of energy, which is spent in order to overcome inertial torque at the moment of the rotor start, is equal to kinetic energy of its uniform rotation. In order to determine this energy, it is necessary to know mass of the rotor, moment of inertia I_i and the rotations n. Kinetic (mechanical) energy (power) of the rotor, which rotates uniformly with n=2000 r/m, is equal to [3].

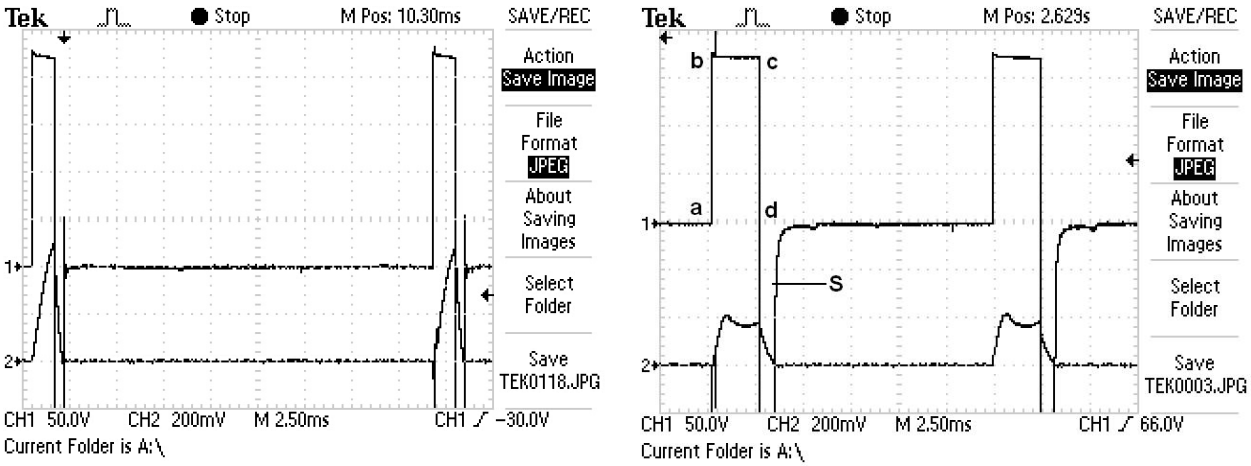
$$E_K = \frac{1}{2}\cdot I_i\cdot\omega^2 = \frac{1}{2}\cdot\frac{1}{2}mr_i^2\cdot\left(\frac{\pi\cdot n}{30}\right)^2 =$$
$$= \frac{9.80}{4}\cdot 2.65\cdot(0.045)^2\cdot\left(\frac{3.14\cdot 2000}{30}\right)^2 = 576.0J = 576.0W = P \qquad (3)$$

Inertial torque M_i, which generates kinetic energy (3) of the rotor that rotates uniformly, is equal to [3]

$$M_i = \frac{P}{\omega} = \frac{30\cdot P}{\pi\cdot n} = \frac{30\cdot 576}{3.14\cdot 2000} = 2.75N\cdot m. \qquad (4)$$

We have calculated the power value (3) at the shaft of the rotor, which rotates uniformly, and inertial torque (4), which accompanies this rotation and which is not accepted by Newtonian dynamics [3]. Thus, on the shaft of MG-1 rotor, which rotates uniformly with n=2000 r/m, mechanical power being equal to 576.0 W (3) and inertial torque, which generates this power and is equal to 2.75 N·m (4), are present .

Voltage from the primary energy source is supplied to the excitation winding of MG-1 rotor in the form of pulses, which duration and amplitude can be adjusted. In Fig. 4, a, the voltage pulses of minimal duration, which has been achieved, are given; in Fig. 4, b, the voltage pulses of greater duration are given [4].



a) in case of minimal pulse duration **b)** in case of greater pulse duration

Fig. 4. Oscillogram of MG-1 idle run:

Amplitude of voltage pulses (Fig. 4, a), which are supplied to the excitation winding of the rotor, is equal to U_A=225 V approximately, and relative pulse duration is $S_U = 17$. Amplitude of current pulses in the excitation winding of the rotor, is equal to $I_A = 5.0A$, and relative pulse duration is $S_I = 34$. Taking this into consideration, average values of voltage and current are equal to (Fig. 4, a):

$$U_C = \frac{U_A}{S_U} = \frac{225}{17} = 13V; \tag{5}$$

$$I_C = \frac{I_A}{S_I} = \frac{5.0}{34} = 0.15A. \tag{6}$$

It is natural that average pulse electric power, which is supplied to the excitation winding of the rotor, is equal to

$$P_C = U_C \cdot I_C = 13 \cdot 0.15 = 1.90W. \tag{7}$$

In the oscillogram, which is given in Fig. 4, b, the voltage pulses have greater duration and the current pulse form is not triangular. Relative pulse duration of the voltage pulses is $S_U = 5.93$, and relative pulse duration of the current pulses is $S_I = 6.83$. Voltage pulse amplitudes are equal to U_A=175 V, and current pulse amplitudes are equal to $I_A = 1.9A$.. Taking this into consideration, their average values are equal to $U_C = 29.51V$, $I_C = 0.28A$, respectively, and average value of pulse electric power is equal to

$$P_C = U_C \cdot I_C = 29.51 \cdot 0.28 = 8.26W. \tag{8}$$

But modern study guides in electrical engineering and electrodynamics consider the results (7) and (8) to be erroneous and recommend to divide the product of the amplitudes of voltage pulses U_A and current pulses I_A by relative pulse duration only once [4].

$$P_C = \frac{U_A \cdot I_A}{S}. \tag{9}$$

This formula is true for a calculation at the terminals of the primary energy sources, because they all generate continuous voltage, which cannot be divided by relative pulse duration of

the voltage pulses, which are supplied to a consumer. How is it possible to use this formula for the calculation of average pulse power when the relative pulse durations of voltage pulses and current pulses are different? There are no recommendations, because the authors of the study guides where this formula is given are unfamiliar with the law of power formation in an electric circuit. It runs as follows: **average power in any section of an electric circuit is equal to the product of the average values of voltage and current (7), (8) [4].** As network voltage is continuous voltage, not pulse one, we have not right to divide such voltage by relative pulse duration according to the law of power formation in the electric circuit when determining average power at the electric power meter terminals. In this case, the law allows us to divide only current by relative pulse duration. Taking this into consideration, power at the electric power meter terminals, which originates from the oscillogram in Fig. 4, a, is equal to [4]

$$P_C = \frac{U_A \cdot I_A}{S_I} = \frac{225 \cdot 5.0}{34.0} = 33.0W \ . \qquad (10)$$

Continuous voltage, not pulse voltage, is supplied to the power unit of MG-1 rotor; that's why power, which corresponds to the oscillogram in Fig. 4, b, and is taken by the power unit from the mains, is

$$P_{CC} = \frac{U_A \cdot I_A}{S_i} = \frac{175 \cdot 1.9}{6.83} = 48.68W \ . \qquad (11)$$

How should one understand the power values, which are calculated according to the formulas (10) and (11), and the power values, which result from the oscillograms in Fig. 4, a, and Fig. 4, b, are calculated according to the formulas (7) and (8)? If we divide only the current pulse amplitude by the relative pulse duration when multiplying the amplitude values of voltage and current, the physical essence of this operation means that voltage is supplied to the rotor winding continuously, not by pulses. It corresponds to power at the primary energy resource terminals and (as the oscillograms in Fig. 4 show) does not correspond to pulse power at the consumer terminals, because voltage is supplied to him by pulses, not continuously. What should be done? It is necessary to understand that the amount of pulse powers at various parts of the electric circuit is not equal to power, which is taken from the primary energy resource. It is an unusual result, but all contradictions in the pulse power balance analysis process are eliminated only if this result is held as an authentic one. The elimination of these contradictions provoked by the necessity to obtain the analysis results of the energy processes in the consuming units of pulse electric power, which correspond the reality that is checked by a coherence of the electric power being consumed and power of the chemical reactions, which take place, for example, in case of water electrolysis [4].

Thus, power, which is consumed by MG-1 power unit form the primary energy source with continuous voltage, is 33.0 W (10) or 48.68 W (11), and pulse powers, which are supplied by the power unit to the rotor excitation winding, are 1.90 W (7) or 8.26 W (8).

As the rotor rotates uniformly, the first Newton law states that the amount of the momenta, which have influence with it, is zero [3]. It means that the rotor, which rotates uniformly, requires no additional energy or power in order to support its uniform rotation, but an experiment denies it. The rotor can rotate uniformly only on conditions that 33 W or 48.68 W of power are supplied into its power unit from the external power source. The law of formation of power in the electric circuit itemizes that 33 W (10) and 48.68 W (11) powers, which are supplied into the power unit of the uniformly rotating rotor, correspond to continuous voltage at the primary power source terminals. Both voltage pulses and current pulses are supplied to the rotor excitation winding; that's why actual electric power, which is supplied to the rotor winding, is 1.9 W (7) and 8.26 W (8). It is closer to zero, which corresponds to the first Newton law, but is not equal to

zero; it proves inadequacy of this law [3]. Let us analyze the physical essence of an implementation of 1.9 W (7) and 8.26 W (8) pulse powers [4].

In Fig. 2, the positive inertial torque $+Mi$ corresponds to mechanical energy (power) of the uniformly rotating rotor. Power, which corresponds to this torque, is 576.0 W (3). This power is present at the rotor shaft constantly when it rotates uniformly. When the voltage pulses with the amplitudes of U_A=225 V or U_A=175 V are supplied to the rotor winding, the current pulses with the amplitudes of I_A=5.0 A (Fig. 4, a) or 1.9 A (Fig. 4, b) are formed simultaneously. The average values of these pulses are U_C=13.0 V (5), I_C=0,15 A (6) or U_C=29.51 V (5) and I_C=0,28 A, and their average electric powers are 1.90 W (7) and 8.26 W (8). They are the actual electric powers of the pulses, which are supplied from the primary energy source to the rotor winding. They are added to the value of inertial mechanical power of 576.0 W (3), which is present at the rotor shaft constantly during its uniform rotation (Fig. 2). As a result, constant inertial torque gains a pulse addition (Fig. 2), which value corresponds to the electric power pulse of P_C=1.90 W (7) and P_C=8.26 W (8).These additions are spent in order to overcome resistances $+\Delta Mc$, which are formed by the processes of voltage and current generation in the rotor winding when its circuit is closed (Fig. 2, intervals $B_1\tilde{N}_1$ and $B_2\tilde{N}_2$). When the rotor circuit is opened, these resistances disappear (Fig. 2, interval $\tilde{N}_1...\hat{A}_2$ or D…E); the remaining reserve of inertial torque $+\Delta Mi$ continues to rotate the rotor till the time of its next pulse acquisition (Fig. 2, point A_2). It appears from this that the rotor takes the electric energy pulses, which average power is 1.90 W (7) or 8.26 W (8), from the power unit. Powers of 33 W (10) and 48.68 W (11) correspond to continuous voltage of the mains, not pulse voltage. Let us again pay attention to the fact that powers of 33.0 W and 48.68 W correspond to the average continuously generating voltages of the mains, not to the average pulse voltages, which are supplied to the rotor brushes of MG-1 motor-generator [5].

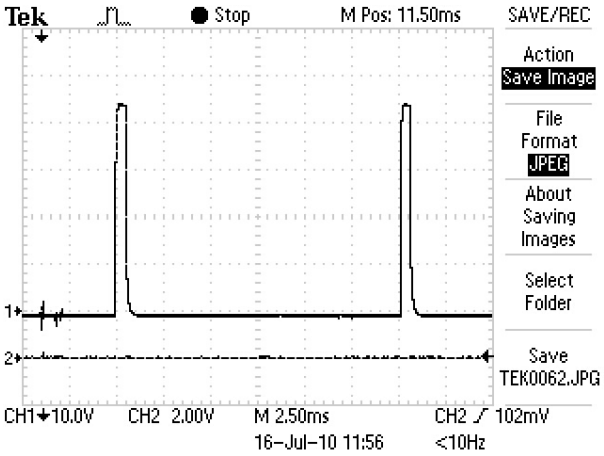
We have considered the process of MG-1 rotor start and the process of its uniform rotation in case of minimal duration of the voltage pulses (Fig. 4, a), and we are surprised by a small value of electric power of 1.9 W (6), which provides a uniform rotation of the rotor with mass of 2.6 kg and frequency of 2000 r/m. This surprise is a result of a neglect of 576 W of power, which is always present at the MG-1 rotor shaft during its uniform rotation. This neglect is caused by the erroneous first Newton law. It is necessary to understand that powers of 1.9 W or 8.26 W are spent for a generation of the voltage and current pulses only in the rotor excitation winding.

Thus, 576 W of mechanical power, which is always present at the rotor shaft, overcomes <u>all types of constant resistances to its rotation</u>, and the pulses of electric power of 1.9 W or 8.26 W (Fig. 2, intervals $\hat{A}_1\tilde{N}_1.....B_2C_2....$) form the moments of magnet during the interaction of the magnetic poles of the rotor and the stator, support consistency of inertial torque and form the working pulses of induction EMF and self-induction EMF in the stator winding simultaneously [5]. It is a very economical process of the simultaneous generation of electrical and mechanical power pulses.

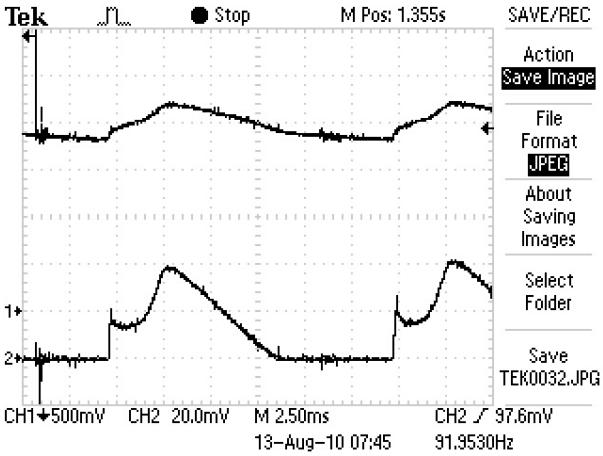
Let us pay attention to a narrow pulse (Fig. 4, b) S, which takes place in the rotor excitation winding after the induction EMF pulse formation (Fig. 4, a, b, c, d). This is a self-induction EMF pulse. The pulses of the induction EMF and the self-induction EMF are generated in the stator winding as well. A loading forms the power pulses in the stator winding; that's why one chooses such stator winding parameters that they can correspond to power, which is necessary for the consumer. An electrolyzer has been chosen as the main consumer of MG-1 stator power pulses. As the electrolysis process is carried out with large current, the stator winding was made in order to get current pulses up to 100 A with voltage pulses of 12 V. It was planed to use these pulses for water electrolysis. But after the first tests of MG-1 it was necessary to make corrections of this plan. Their essence resulted from simplicity of the separation circuit of the pulses of induction EMF and self-induction EMF in the stator winding. It made it possible to use them separately. A cell of the electrolyzer receives the pulses of self-induction EMF and decreases their amplitude up to 2 volts automatically and increases pulse duration, respectively. When the pulses of self-induction EMF are used, their relative pulse duration in the electrolyzer becomes

less than relative pulse duration of the pulses of induction EMF. It is the main cause of the energy effect resulting from the use of the pulses of self-induction EMF in the stator winding, for which no energy of the primary source is spent, because they are formed at the time of voltage supply switch-off to the rotor excitation winding. Besides, reactive self-induction EMF of the stator winding with the increased duration of the pulse is returned to the rotor winding at the stage of its switch-off from the energy source as well [5].

Let us take one cell of the classical electrolyzer as a self-induction EMF energy consumer and take at the beginning the oscillograms of voltage and current at the stator terminals (Fig. 5, a) and after a connection of the electrolyzer at the electrolyzer terminals (Fig. 5, b).



a) self-induction EMF pulses in the stator



b) the same self-induction EMF pulses in the electrolyzer

Fig. 5. Self-induction EMF pulses in the stator winding:
a) prior the connection of the electrolyzer;
b) after the connection of the electrolyzer

It is known that water electrolysis takes place when average voltage per cell is nearly 2 V. Why? It is unknown. An influence of the number of cells on the electrolyzer efficiency is unknown too. An answer to this question was obtained recently when MG-1 self-rotating generator was used for electrolyzer supply. It produces the voltage pulses (Fig. 5), which have no direct connection with the primary energy resource: an accumulator or the electric mains. Amplitude and frequency of the voltage pulses, which are produced it, are closely connected with its design and are stipulated by its rotation frequency. In Fig. 5, a, one can see an oscillogram of the **self-induction EMF** pulses being generated in MG-1 stator winding in idle run at the time of a disconnection of the electric circuit, which provides supply to the rotor winding; an oscillogram of the same pulses in the electrolyzer cell is given in Fig. 5, b [5].

It is natural that in order to increase power of the pulses being generated in the stator winding it was necessary to increase pulse duration in the rotor winding. As a result, electric power of the pulses at the rotor shaft, which were calculated according to the formula (7), was increased up to 26 W. A lamp with power of 20 W was connected to the stator induction EMF circuit; one cell of the electrolyzer was connected to the stator self-induction EMF circuit. When the oscillograms were processed, it turned out that average pulse electric power at the cell terminals is 22 W and at the lamp terminals is 4 W. Their total value was 26 W by full glow of lamp with power of 20 W, i.e. actual power in the stator winding exceeded power in the rotor winding almost twice if we do not take into account energy of the gases being produced (hydrogen and oxygen). A video concerning MG-1 operation demonstrates an intensity of gases release from one cell of the electrolyzer. This intensity is equivalent to the intensity of gases release from a series electrolyzer of LIGA-12 gas welding apparatus when it consumes more than 200 W

from the mains. It is much greater than electric power at the rotor shaft being obtained from the primary energy resource, and old electrodynamics prohibits such result [1], [2], [5].

CONCLUSION

Newton dynamics and Maxwell electrodynamics were the main obstacles on the way of the creation of a motor-generator by a great number of talented engineers and inventors of several generations. The motor-generator was created only due to the new laws of mechanodynamics [3] and the new laws of electrodynamics of microworld and macroworld [4].

A determination of current direction in the wire as well as magnetic field, which is formed round it, with the help of the so called “right-hand and left-foot rule” seems very ridiculous now. The old electrodynamics knowledge, which states a presence of the positive and negative electric charges in the wires, seems even more ridiculous. The old notions concerning the positive and negative electric charges, which form the electrostatic charges, seem funny as well.

The scientists, who work in the field of thermodynamics, are short of luck too. They have failed to understand why there is a limit for low temperature; still, they do not understand how temperature is formed in space round us and where the physical essence of heat and temperature is.

But the chemists, who think that the electrons move along the orbits round the atomic nuclei and join them into molecules mysteriously, look the most ridiculously.

We are proud of the achievements in the field of formation and transmission of information, and we have little notion that they are the result of the experimental investigations, which are carried out according to one method: the trial and error method. None of the scientists of the world understands physics of the computer operation.

Our descendants will laugh at a wish of our contemporaries to describe the information transmission processes with the help of Maxwell equations when any knowledge concerning physics of the processes of formation, transmission and reception of information is absent.

The astrophysicists are in the most ridiculous state. The descendants will laugh at their fairy tales concerning the black holes and the Big Bang in the same way as we laugh now at the knowledge of our ancestors who thought that the Earth was supported by three whales.

Certainly, err is human; that’s why billions dollars, which are spent by the scientists in order to make the photons move circle-wise in the magnetic field, are nothing as compared with the silly expenditures made by the politicians who wage wars thousands kilometers from their borders.

We have touched upon a small part of the scientific problems of modern physics and chemistry. They are numerous. Almost all of them have been analyzed; the causes of their existence have been stated; the solutions, which are eliminate these causes, have been found [4]. Modern knowledge on microworld can give answers to 1500 questions concerning the structure of the inhabitants of microworld and their interactions. A part of them can be found on the site http://kubsau.ru/science/prof.php?kanarev in the folder “Study guides”.

The main conclusion appears from the experiments, which have been described by us: when the accumulator is used for the rotor excitation winding supply, one of EMF pulses in the stator winding can be used for accumulator charging, another pulse can be used for a technological process (water electrolysis, for example). As a result, a stand-alone energy source is formed with service life, which is equal to service life of the accumulator. When energy effectiveness of such energy source is determined, the notion “efficiency” loses sense, because such energy unit can serve during 5 years requiring no other energy sources.

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