GENETIC DATA BLOCK OF THE INFORMATION CERTIFICATE OF THE FUNCTIONAL CLASS OF ROTATING AND PROGRESSIVE MOTION ASYNCHRONOUS MOTORS

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Introduction. Current trends in the development of the class of electromechanical energy converters include polyfunctionality and the possibility of direct alignment with the elements and structural units of production complexes [1]. The implementation of these trends is possible, in particular, by creating an EMPE capable of realizing complex (combined) types of spatial motion of the secondary part: rotational-translational, plane-parallel, space-concentric. Robotic manipulators or industrial robots are a number of devices that have a mechanical manipulator and a programmable control system in their design. The robot is used for various tasks in production: when moving different objects, soldering, welding, painting, etc. - the robot is able to perform monotonous boring operations as quickly as possible effectively and to provide the required quality of the product or operation. According to the algorithm of development and creation of an information certificate of an arbitrary functional class of electromechanical energy converters based on the use of the effect of "genetic memory" [2] in determining and deciphering the genetic program of the studied class using information of one real class representative, one of the direct tasks is to form a block of genetic data of an arbitrary functional class. Preliminary research results show that electromechanical objects and systems are carriers of genetic information that is uniquely recognized through the structure of the object and reproduced as a universal genetic code [2]. Genetic information is a prerequisite for the reproduction of genetic programs that focus highly intelligent information on the structural potential of electromechanical objects. Genetic data block in structure of information certificate of the functional class opens the possibility of creating highly effective genetic banks of innovation and genetic knowledge bases.

The aim of the work. Development of the genetic data block in the structure of the genetic certificate of the rotating and progressive motion asynchronous motors for robotic systems and complexes functional class, recognition and decoding of a class genetic programs using the "genetic memory" of the selected electromechanical object.

Materials of research. In accordance with stated aim of the work the main objectives of this study are follofing: 1) to identify and analyze the genetic information of the investigated electromechanical object; 2) to identify and analyze the genetic program of the rotating and progressive motion asynchronous motors for robotic systems and complexes functional class based on the use of the "genetic memory" effect of a real electromechanical object; 3) to present the genetic program of the rotating and progressive motion asynchronous motors for robotic systems and complexes functional class in certain form usable for creating of the information certificate of the class being researched.

Synthesis procedures and the sequence of genetic transformations that correspond to an algorithm built on the principle "from simple to complex" are summarized in Table 1.

The genetic model (Table 1) shows that the program of the hybrid system is determined by a chromosomal set of 1 paired chromosome and two parent CL 0.2 y and CL 2.0 x. The level of genetic complexity of the system is determined by the fourth generation chromosome of S_{4221}.

Table 1 – The results of the decoding of the genetic program of the studied EM-system

Complexity level	**Chromosome code**	**Structural formula**	**Chromosome status**
0	*ЦЛ 2.0x*	*ЦЛ 2.0x*	Parental
	ЦЛ 0.2y	*ЦЛ 0.2y*	Parental
	S_{01}	[ЦЛ 2.0x: $R(k_R = 2)$]$_1$	Replicated, informative
	S_{02}	[ЦЛ 0.2y: $R(k_R = 2)$]$_1$	Replicated, informative
1	S_{11}	(ЦЛ 2.0x: M^{EM})$_1$	Informational, mutated
	S_{12}	(ЦЛ 0.2y: M^{EM})$_1$	Informational, mutated
2	S_{211}	[3 ЦЛ 2.0x: R_{OY} ($k_R = 3$)]$_1$	Replicated, informative
	S_{212}	[ЦЛ 0.2y: M_{OX} ($L_2 > L_1$)]$_2$	Informational, mutated
3	S_{3211}	[2 (3 ЦЛ 2.0x: M^{EM}: R_{OY}): R_{OY}]$_1$	Replicated, informative ($K_R = 2$)
	S_{3212}	[3 (3 ЦЛ 2.0x: M^{EM}: R_{OY}): R_{OY}]$_1$	Replicated, informative ($K_R = 3$)
	S_{3213}	[4 (3 ЦЛ 2.0x: M^{EM}: R_{OY}): R_{OY}]$_1$	Replicated, informative ($K_R = 4$)
3	S3221	*[3 (ЦЛ 0.2y: MEM: ROY): ROY]1*	Replicated, informative *(KR = 3)*
	S3222	*[6 (ЦЛ 0.2y: MEM: ROY): ROY]1*	Replicated, informative *(KR = 6)*
	S3223	*[9 (ЦЛ 0.2y: MEM: ROY): ROY]1*	Replicated, informative *(KR = 9)*
4	S4210	*ЦЛ {[2 (3 ЦЛ 2.0x: MEM: ROY): ROY] × (6 ЦЛ 0.2y: MEM: ROY)}1: [ЦЛ 0.2y: MOX (L2 > L1)]2*	Hybrid, information
	S4211	*ЦЛ {[2 (3 ЦЛ 2.0x: MEM: ROY): ROY] × (6 ЦЛ 0.2y: MEM: ROY)}1: [ЦЛ 0.2y: MOX (L2 > L1)]2*	Hybrid, generative
	S4212	*ЦЛ {{[2 (3 ЦЛ 2.0x: MEM: ROY): ROY] × (6 ЦЛ 0.2y: MEM: ROY)}1: [ЦЛ 0.2y: MOX (L2 > L1)]2}:IP*	Hybrid, generative, inversion
	S4213	*ЦЛ {[2 (3 ЦЛ 2.0x: MEM: ROY): ROY] × (6 ЦЛ 0.2y: MEM: ROY)}1: [ЦЛ 0.2y: ROY (KR = 2): MOX (L2 > L1)]2*	Hybrid, paired, generative, replicated

The structure of the synthesized chromosome S_{4221} determines the level of genetic complexity of a given hybrid EM system, which in a symbolic representation is described by its structural formula

$$CL\ \{[2\ (3\ CL\ 2.0x\colon M^{EM}\colon R_{OY})\colon R_{OY}] \times (6\ CL\ 0.2y\colon M^{EM}\colon R_{OY})\}_1\colon [CL\ 0.2y\colon M_{OX}\ (L_2 > L_1)]_2 \rightarrow S_{EM}$$

Together with a given hybrid EM system, the level of genetic complexity is also synthesized by the inverse and chromosome replicated on the secondary bristle, respectively

$$CL\ \{\{[2\ (3\ CL\ 2.0x\colon M^{EM}\colon R_{OY})\colon R_{OY}] \times (6\ CL\ 0.2y\colon M^{EM}\colon R_{OY})\}_1\colon [CL\ 0.2y\colon M_{OX}\ (L_2 > L_1)]_2\}\colon I_P \rightarrow S_{EM}^{*}$$

$$CL\ \{[2\ (3\ CL\ 2.0x\colon M^{EM}\colon R_{OY})\colon R_{OY}] \times (6\ CL\ 0.2y\colon M^{EM}\colon R_{OY})\}_1\colon [CL\ 0.2y\colon R_{OY}\ (K_R = 2)\colon M_{OX}\ (L_2 > L_1)]_2 \rightarrow S_{EM}^{**}$$

According to the principle of periodicity of genuses, similar hybrid structures will also occur in the other five geometric classes of the first large period of the Genetic Classification. The set of structures of genetically permissible digestibrides, within the first large period, is written in matrix form.

The structure of the matrix can be regarded as a form of compact representation of the desired genetic program of the functional class of hybrid EM objects [3]. The program determines not only the quantitative composition of the permissible species and genera of the class, but also their new systemic properties (emergence), which they obtained as a result of crosses. For topological type hybrids, such properties are determined by the different electromagnetic symmetry of the combined active surfaces (windings) and the possibility of creating two types of field waves within the same structure (realization of combined types of motion of moving parts: rotational-translational, plane-parallel and rotary-concentric).

Conclusions. According to the results of the study it was identified and analyze the genetic information of the investigated electromechanical object; identified and analyze the genetic program of the rotating and progressive motion asynchronous motors for robotic systems and complexes functional class based on the use of the "genetic memory" effect of a real electromechanical object; presented the genetic program of the rotating and progressive motion asynchronous motors for robotic systems and complexes functional class in certain form usable for creating of the information certificate of the class being researched.

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