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«Advanced Technologies in Aerospace, Mechanical and Automation Engineering» MIST: Aerospace – 2019

«Object model of technical solutions for designing a locomotive train drive»

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Problem statement

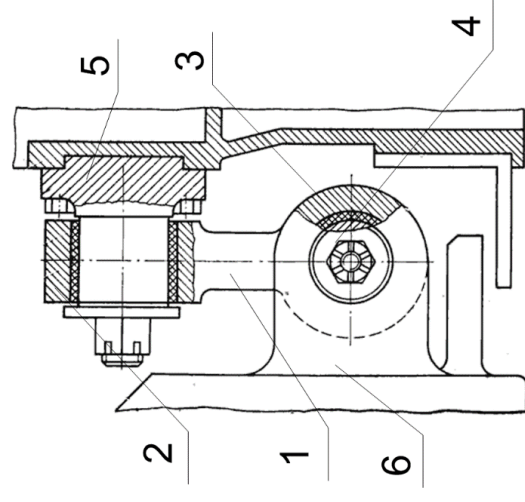
- The task of creating a method for constructing components and parts of a locomotive drive allowing not only to simulate the physical properties of the latter but also to form and automate the recognition of technical solutions, is considered. A model of a traction drive, which is a system of sets of descriptions of real objects of the set which makes it possible to create mathematical models of the structure in the form of a set of related elements included in the libraries of well- known solutions is proposed. In contrast to previously known methods based on the procedure of creating new solutions



its development (while the design task is to create

Solution methods

- The suspension of the HS4000 locomotive electric motor (Fig. 1) can be represented as a system from the “Traction”, “Upper hinge” and “Lower hinge” structures, which are connected with the “Axis”, “Bracket on the frame” carts and “Bracket TM” and with each other.



1 – “Traction”; 2 – “Upper hinge”; 3 – “Lower hinge”; 4 – “Axis”; 5 – “Bracket on the trolley frame”; 6 – “TM Bracket”

Figure 1. Breaking up into substructures of the suspension of an electric motor



Conclusions

Results, implementation

- The question of choosing a mathematical model for the design of a locomotive drive is considered. It has been established that the main drawback of the known methods of modeling new technical solutions for the mechanical part of a locomotive drive is the use of an elemental-evolutionary approach.
- An object model for the design of a locomotive train drive is proposed in the form of a hierarchy of description

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