STUDY OF A LINEAR PULSE ELECTROMECHANICAL CONVERTER WITH A DOUBLE ANCHOR

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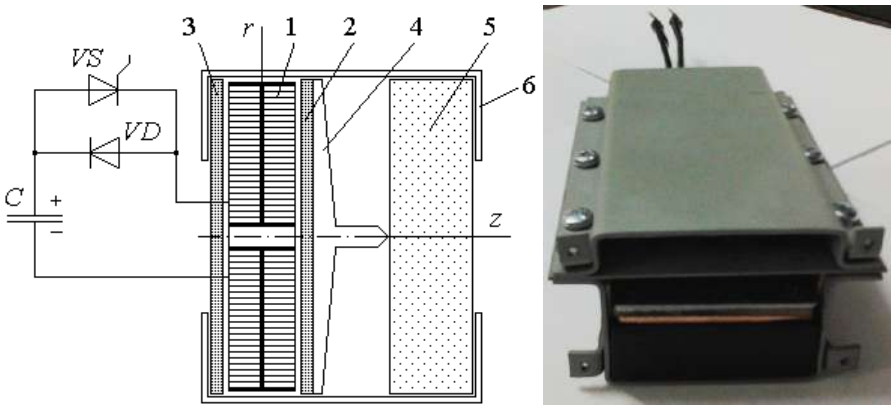
The design of a linear pulsed electromechanical transducer (LPET) of coaxial configuration, containing a fixed inductor 1 and a double anchor, covering the inductor from opposite sides [1] (Fig. 1) is considered. The front part of the anchor (AFP) 2 and the rear part of the anchor (ARP) 3 are made in the shape of coaxially mounted disks, covering the inductor from opposite sides. To the AFP 2 the head 4, directed towards the object of impact 5 is attached. The rear part of the armature 3 and the object of influence 5 on the outer surface are covered by fixing brackets 6.

Using a mathematical model that takes into account interconnected electrical, magnetic, thermal and mechanical processes, the influence of geometric parameters on the electrodynamic characteristics and LPET indicators of induction type with a double anchor, covering the inductor from opposite sides, has been established.



a *b*

Fig. 1. Construction (*a*) and general view (*b*) of LPET with double anchor: 1 - inductor; 2 - AFP; 3 - ARP; 4 - head; 5 - the object of impact; 6 - fixing brackets

The ways of increasing the power indices of LPET - the maximum value and the pulse of electrodynamic forces between the parts of the double armature are determined. It was found for the first time that the power indices of LPET increases with the maximum approachment of both parts of the double anchor to the inductor and with an increase in the number of turns given dimensions of the inductor is constant and also with a decrease in the width of the copper bus and the width of the inductor.

A sample of a dual-anchor LPET induction type designed to destroy information placed on a solid-state digital SSD drive (Fig. 1b) was developed and experimentally tested.

References:

1. Болюх В.Ф., Кочерга А.И., Щукин И.С. Электромеханические процессы в линейном импульсно-индукционном электромеханическом преобразователе с подвижным индуктором и двумя якорями // Електротехніка і електромеханіка. – 2018. - № 2. – С.11-17.