

**IMPROVEMENT OF SINGLE-BUCKET HYDRAULIC
EXCAVATOR WORKING EQUIPMENT TO PREVENT VIOLATION OF
THEIR DESIGN PARAMETERS WHEN CLEANING CONCRETE
CHANNELS.**

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***Abstract:** During the cleaning of channels and collectors, hydraulic excavators cause a change in the design parameters of the facility. In order to prevent this, it is necessary to use hollow teeth of rotary excavators when cleaning irrigation systems, and with this, it is possible to achieve a decrease in the volume of earthworks and an increase in work productivity.*

***Key words:** concrete-covered channels, working equipment, bucket, excavator, spring, support, water management, exploitation, water resources, system, hydrotechnical structures, puck, bolt, tooth, cylinder, piston, technical reliability, muddy sediments.*

The duties of the Cabinet of Ministers of the Republic of Uzbekistan for 2018-2022 are assigned in the State Program for improving the land reclamation and rational use of water resources. At this point, the fact that our government pays a lot of attention to the field of water management and allocates billions of soums for the repair, restoration and reconstruction of the powerful water management system in our republic, the technical reliability of hydrotechnical facilities, by increasing its operational efficiency, extending their current and capital maintenance periods, it shows how urgent the issues of effective use of water resources are. Therefore, concrete covers are seriously damaged during the cleaning process of concrete-covered channels today.

Taking into account the above, we managed to improve the working equipment of the excavator as part of our research and observations. Our device consists of three parts: a support 1, a spring 2, a bolt 3, and pucks, which fix the tooth. The spring is located between the support 1 and teeth 3 fixed to the excavator bucket. Holes are opened for fastening the lower and upper parts of the spring to the support 1 and tooth 3.

The support 1 on the bucket allows the lower part of the spring to stay firmly in place. The upper part is inserted into the 3rd lower cavity of the tooth and locked. One hole is opened on both sides of the hollow part of the tooth 3, where the spring 2 is fixed, so that the tooth 1 is firmly seated on the spring 3. In the process of cleaning concrete-lined canals from mud and sediments, the springs are compressed when the excavator bucket hits the bottom of the channel, and the weight of the excavator bucket falling on the concrete is reduced due to the compression and expansion of the spring. As a result, the integrity of the concrete coating is ensured.

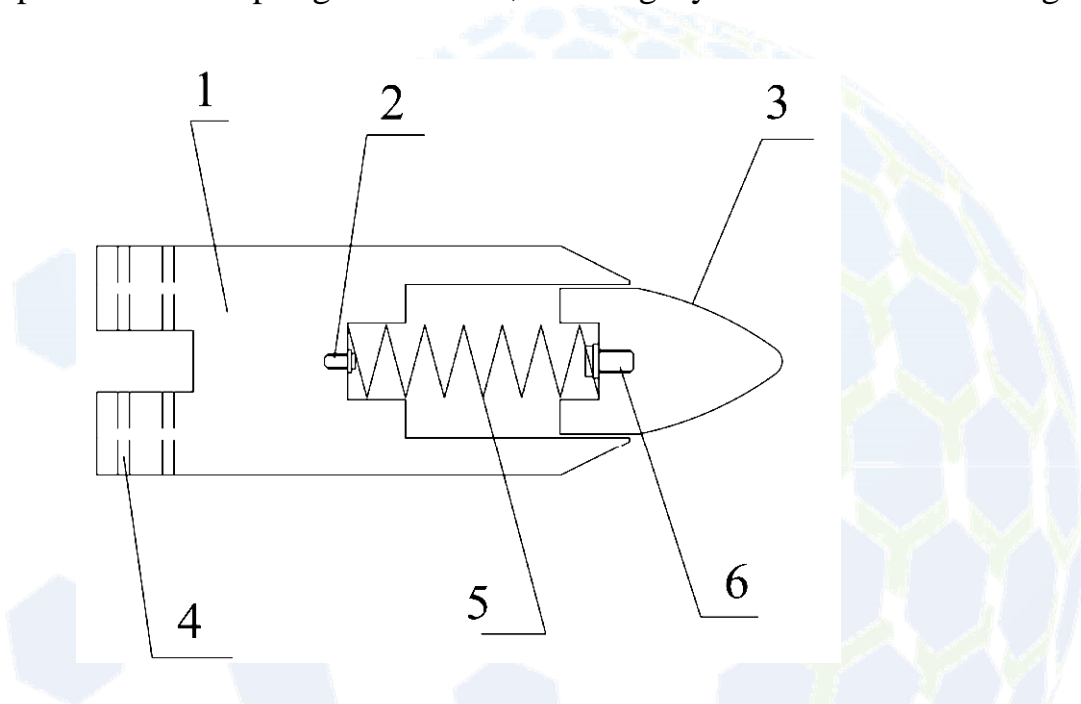


Figure 1: Recommended working equipment scheme.

1 - support part, 2 - spring, 3 - tooth (cutting part), 4 - bolt seat for fastening to the tub, 5,6 - fixed bolts.

The working device moves as follows: there is a rectangular hole of 6 cm depth for fastening the spring to the tooth, a groove is formed on the support part of the tooth as if the piston moves inside the cylinder, tooth 3 is formed to reduce the impact when the tooth hits the concrete slab, and spring 2 is installed between support 1. When the tooth hits the bottom of the concrete channel, the spring compresses and expands when it rises, preventing concrete cracking and ensuring its integrity.

So, the device consists of a support, a spring, and bolts and pucks that fix it on the bucket. The spring is located between the bucket and teeth of the excavator. The installation of this spring divides the length of the bucket into three parts. The lower and upper parts of the spring are fixed to the support and to the teeth. The

support spring on the bucket allows the lower part to stay firmly in place. The upper part is inserted into the lower cavity of the tooth and fixed. One hole is opened on both sides of the hollow part of the tooth, where the spring is fixed, thereby ensuring that the tooth sits firmly on the spring. In the process of cleaning concrete-lined canals from mud and sediments, the springs are compressed when the excavator bucket hits the bottom of the channel, and the weight of the excavator bucket falling on the concrete is reduced due to the compression and expansion of the spring. As a result, the integrity of the concrete coating is ensured.

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