Experience of operation of closed irrigation networks testifies to the low efficiency of their work that is caused by frequent downtimes owing to the failure of pressure head pipelines and sprinkler machines. It is known from the literature that frequent bursts of pressure pipelines occur due to hydraulic shocks that occur when starting and stopping pumps, or starting and stopping sprinkler machines, [1]. The main reason for unsatisfactory operation of the closed irrigation network is the low level of operation and the lack of a minimum number of highly efficient technical devices that help stabilize network pressures and, thus, increase the efficiency of both closed irrigation networks and sprinkler machines.

One of the proposed tools is a device for closing the valve without a water hammer, which uses the following hydraulic drive, Fig. 1, a Ukraine patent for a utility model № 28098, [2, 3].
The device works as follows. When closing the valve, the water from the pressure pipe through the throttle 10 enters the upper part of the hydraulic cylinder 2 and is discharged from the lower part 3. If the pressure drop across the throttle is in the working zone, then its capacity, according to the characteristics, is maximum.

If the drop reaches the maximum allowable value of \( p_{\text{max}} \), the elastic sleeve compresses the triangular grooves and the closing of the latch is stopped, until the difference in the throttle is reduced.

In the case of the necessity to use more advanced characteristics of the one-way throttle, can be used the proposed option, Fig. 2, [4].

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Fig. 1. **Device for the closing of the valve without water hammer**

Fig. 2. **The scheme of a one-sided throttle with an elastic sleeve:**
- a) cross-section of the throttle;
- b) cross-sections of different variants of the working body of the one-way throttle;
- c) different shapes of triangular grooves
Conclusions. The advantages of the device include; prevention of significant waves of high pressure; the property of self-washing of the throttle by the return flow of water.

References:


