**ESSAY**

The mechanism of plastic crimping of the strand has been identified and justified, as the process of formation of arches: a strong arch of wires, the appearance of each leads to a change in the stressed state of the strand at the stages of reduction. It is established that before the appearance of the first arch, the wires of the outer layer and the central wire are the most priority deformations, with the initial absence of side contacts. After the appearance of each arch, the stresses in the wires of the arch layer become predominantly compressive, which temporarily prevents the given layer from actively deforming, up to the formation of arches in all other layers of the strand. After the formation of all arches, the wires of the upper layer again become the most priority deformations. The central wire of the strand is overstrained in relation to all other wire strands at all stages of compression.

The developed technique allows to analyze the degree of working out of each wire of a lock at a certain amount of reduction, it reflects the features of deformation of a multilayered strand: a sharp increase in the width of the newly appeared contact at an almost constant reduction; arches formation; the non-simultaneous occurrence of new contacts in strands of strands, due to the geometry of the strand and the direction of the displacement of the wires.

The application of the proposed technique allows to design rational designs of strands and ropes subjected to small and medium circular plastic crimping, as well as to determine the necessary amount of compression of strands and ropes of a particular design, proceeding from the conditions for retaining the flexibility of the rope and forming the required contact geometry of the wires.

It was found that for strands with a diameter 7.68 mm in the construction of 1 + 5 + 5/5 + 10, the most uniform development of the strand and the development of contacts are ensured during the reduction in the range of 3.74% <Q <7.06 %. Intensive filling of the gaps in the strand begins at Q = 7.06 %, which determines the subsequent deformation as the limiting for the ropes working on bending both for performance characteristics and for the conditions of operation of the round caliber of a roller die.