The article is devoted to the questions of raising productivity of a scoop inclined elevator. The actual direction is to develop more advanced bucket structures, which would lead to an increase in the productivity of the inclined bucket elevator by improving the process of its unloading.

The construction of a bucket with a movable bottom of a semi-circular shape (SCS) is offered. To release the bottom in the main part of the scoop, an additional device is used. Main parameters of a scoop inclined elevator with the installed scoops of a semi-circular shape (SCS) are selected. The system of equations of the material particles motion in the SCS ladle (a mathematical model) is suggested. A mathematical model of material particle movement in a bucket with moving bottom of half-round shape which permits (after experimental confirmation) to calculate theoretically the rout of particles about the bucket bottom is offered. As a result we can fix the presence (or absence) of reverse rash of the material from the bucket while removing or unloading it. The methods for calculating the inclined bucket elevator with the mounted SCS bucket is developed. Calculation results are confirmed experimentally. The results of the calculation of bucket elevator performance with the proposed design are presented. High efficiency of such construction work is theoretically substantiated and practically confirmed. The results of calculations and dependences of the material particles' movement in the SCS (based on theoretical and experimental data) are presented.

**Keywords:** bucket elevator, bucket with a movable bottom of semi-circular shape, additional device, mathematical model, productivity, parameters of a scoop inclined elevator.