

**ANALYSIS sieves ZERNODROBAROK design solutions aimed at increasing their longevity**

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*As the separation classifiers crushed grain weight using different devices, among which the most common are sieves. Existing ways and methods to improve the durability of reduced working crushers. Included features of their structure as perforated and actual benefits of using a crusher for crushing grain materials.*

***Crusher, sieve, deck, demolition, crushing, durability, maintenance solutions.***

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**Problem.** Feeding in cattle grain crushers are widely used. They can be used effectively during the grinding and separation of grain materials used in the preparation of concentrated and combined fodder for livestock and poultry farms directly. Crushers found their widespread use during the grinding medium-hard materials and effectively applied in the preparation of concentrated and combined feed. In agriculture, this type of crusher also widespread in the food, construction, chemical and other industries. As the separation classifiers crushed grain mass using a variety of devices, including the most widely found sieve.

**Analysis of recent research.** The main disadvantage of mills is that during grinding product is intense wear hammers and edges of holes separating sieves. Towards improving the life of the hammers done a lot of work. At the same time wear and disability sieves as the main job of separating, pridileno much less attention. The initial form of holes separating sieves crushers smear vary depending on the destination crusher and the material they are ground (Fig. 1).

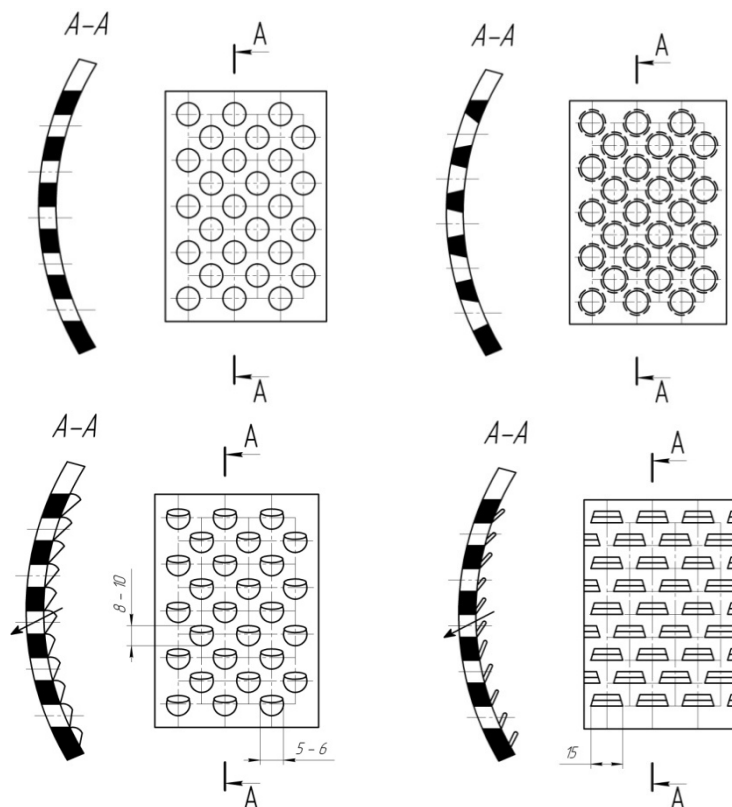


Fig. 1. Typical forms holes kormodrobarok grain sieves.

For all submitted forms holes characteristic type of damage is wearing. Wear leads to an increase in the size of the holes, which reduces the efficiency of separation and degrades the performance of the crusher.

**Results.** According to the operation of the need to replace parts and components of separating working there after 1000-1800 operating time  $t$ . The lowest operating time among them have a sieve with cylindrical holes (1070  $t$ ).

In crusher for crushing grain mass often use smooth sieve with holes 3, 4, 6, 8 and 10 mm, made of sheet steel thickness 1 ... 3 mm. It is noted uneven wear sieves that are much faster lose the initial form holes in the bottom of the camera. Therefore, studies [1] the combined sieve, consisting of two or more parts connected by rivets or bolts through the plate crash.

Noteworthy results of the study [2] which found that increasing longevity sieves can be achieved in the given work surface rippled shape with angles to the horizontal surface  $66,5^\circ$  and  $36^\circ$ . As indicated in the proposed work surface such form not only a positive effect on life extension sieves, but also saves them money separating.

The study [1] proposed to improve the durability of bridges extending between holes sieves in the direction of the product from 9 to 12 mm, and most holes placed on top of an elongated (wrong) hexagon.

The strength and durability of sieves increases by 30 ... 40%, but performance crusher reduced to 9%. Of course it will adversely affect the operation of the crusher. As a result of further development of authors have proposed a new, more stronger Corrugated sieve (Fig. 2), which additionally served as the deck. Productivity, while increased by 23 ... 27% and 40% durability.

Practice operation of mills agricultural land and experience some farms confirmed the possibility of increasing resource sieves by permutation of  $180^\circ$  or bend them in the opposite direction, with worn edges of holes. This increases durability in 1,3 ... 1,5 times.

Statistical analysis of damage sieves showed that 52% fail due to wear jumpers and up to 48% - as a result of falling into the cooking chamber with grain weight solids (stones, bolts, nuts) [1].

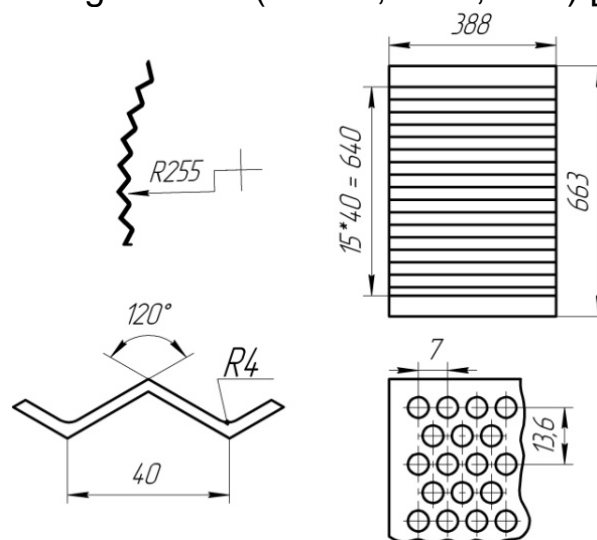


Fig. 2. Corrugated sieve deck-enhanced durability and performance.

The degree of grinding product mainly depends on the mesh size sieves. With decreasing degree of grinding product size increases. The idea of the possibility of changing the square hole by adjusting presented in [6]. The design of the sieve consists of two adjacent parts in contact with the possibility of relative movement of planes. Thus opens the possibility of varying the total passage opening (Fig. 3).

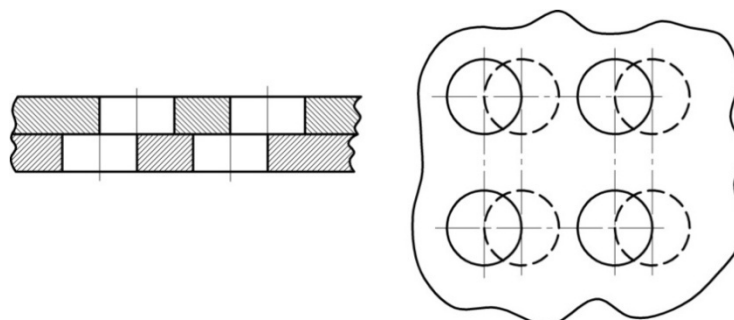


Fig. 3. Sieve which consists of two adjacent contacting parts.

Through this constructive solution sieve unable to obtain a product with the required grinding module that increases the operational capabilities of crushers. Unfortunately in the missing information on the structures of sieves. However, many of the proposed solutions, which is an obvious complication separating the working body and the lack of direct impacts that would contribute to the longevity and preservation form holes.

The study [4] the separation mixture using a sieve made of cylindrical holes, diameter and area which decreases in the direction of rotation of the rotor crusher. The height of the deck reefs are also proportionally reduced, respectively, to the square holes. It is possible to also perform a cylindrical sieve and corrugated deck in separate sections, contributes to their convenient replacement to obtain the required quality grinding or replacement in case of malfunction. Availability replace sieve deck and increases maintainability crush camera less time to recover from the crusher, and thus increases the rate of development. The wavy shape sieve variable curvature proposed in [5] (Fig. 4).

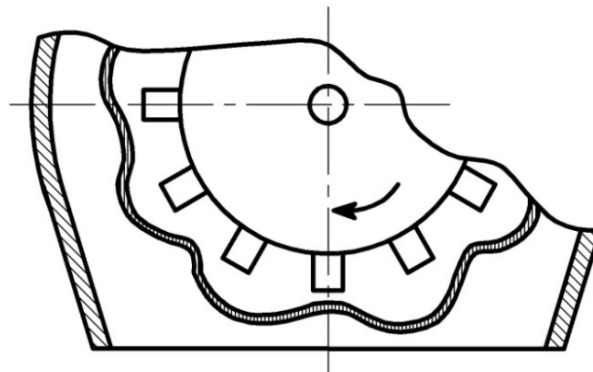


Fig. 4. The wavy shape sieve variable curvature.

Lots of different curvature proposed sieve and alternating convex and smooth surface vhnutoyi interconnected. Variable radius of curvature of the working surface enables the convex areas mainly carry out the process of separating the grain mass, and to further intensify their vhnutyh grinding of separation. This partial separation of functions can be realized by different angles of attack occurring between the worktop and sieves vector velocity of the grain particles. It is expected that these areas and wear will occur with varying intensity. However, research in this area, in addition to studies [6,7] have not made enough of a problem waiting to get new results.

The radical way to combat aging sieves should consider developing designs crushers which classification (division) mixture is carried out without the use of sieves. Without reshitni crusher fundamentally by this problem, but there are other problems related to aging and grinding the mixture additionally installed decks and fittings separation flows. The intermediate position between reshitnyny and without reshitnyny take crusher equipped with deck lattice (Fig. 5).

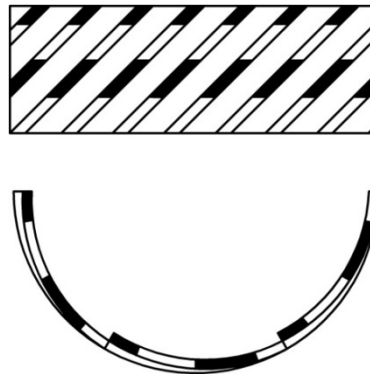


Fig. 5. slatted deck separating the working body of the crusher.

This combined working body has stepped work surface, and that the gap between the hammers in the direction of decreasing in some areas. Are given technical solution facilitates more efficient crushing and separation of grain, which is aimed at improving the performance crusher [7]. However, increased friction in the gap obviously lead to an intensification of the processes of wear as lattice deck and hammers. In this design, as proposed slotted holes (reefs) that placed at an angle to the direction of motion of particles, according to the authors, increase the efficiency of grinding and separation (Fig. 6).

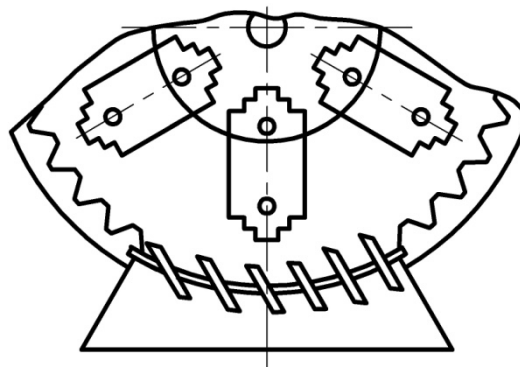


Fig. 6. grille that is designed as a lamellar blinds.

Thus Analytical review shows that the structural elements crushers crushing chambers grain as a result of constant interaction with its mass of grinding and separation are subjected to heavy wear to the gradual loss of capacity. Towards improving design solutions of separating

business conducted many studies, but most of them are aimed at improving the efficiency and quality of separation. Today enough work focused on improving the reliability of the design as necessary indexes modern shredding machines.

**Conclusion.** The analysis showed that the dominant solution for improving separating sieves are constructive. Apparently this is due to the peculiarities of operating conditions and manufacturing techniques which use sieves strengthening coatings or wear resistant material is not technically feasible and economically justified.

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*AS A klasyfykatorov at razdelenyy yzmelchennoy zernovoy Fire-proof compounds yspolzuyut Various Device koryh Among the most rasprostranennymy javljajutsja sieve. Rassmotreny suschestvuyuschie path and methods Increase Durability pryvedennyh workers drobylok bodies. Also Features A uchteny s stroenyya How perforyrovannyh*

*systems and faktycheskye Benefits If you use a crusher for raw materials yzmelchenyya zhyvotnovodcheskyh on farms.*

***Crusher, Sieve, deck, yznos, yzmelchenyya, Durability, Tehnicheskoe decision.***

*As separation of crushed grain mass used different devices, the most common are sieves. Existing ways and methods to improve durability of separating work of crushers. Also take into account features of its structure as perforated systems and actual benefits when used the crushed grain on farm.*

***Crusher, Sieve, deck, wear, crushing, dureliability, technical solution.***

UDC 631,312

## **SHOE DYNAMOMETRUVANNYA TILLAGE WORKING BODIES**

***VP Chicken, Ph.D.***

*The analysis methods and structures of existing devices for the study of power characteristics of agricultural implements in tillage and proposed a new method and device for determining the three components of the resultant force of resistance cultivating working body.*

***Power characteristics, traction resistance, tillage, cultivating your body that make the resistance.***

**Problem.** Dynamometruvannya tillage tools allow for their characterization for energy and power rates, and get your calculations when designing new tillage job of developing them and processes. Conducting such research is aimed at improving the quality of the soil tillage, reduce energy and metal parts and wear by improving the design of tillage implements.

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### **Analysis of recent research**

**The purpose** research is to establish flaws in the methods and design data for existing devices dynamometruvannya agricultural tools to simplify the design of devices of this type, increasing the accuracy of measurements and calculations while minimizing.