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Reparation by Hard Facing of the Damaged Secondary Stone Crushers

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The possibilities for reparation by hard facing of the damaged working parts – the hammers of the secondary stones crusher are investigated in this paper. The analyzed crusher is stationary and it belongs into a group of the process equipment aimed for producing the crushed stone. The produced stone is later used for manufacturing various construction materials like asphalt, concrete, etc. Wear of the crusher's working parts occurs during the exploitation due to operation with very hard materials. That wear is usually abrasive and of high intensity what causes failure of the working parts and consequently the machine's downtimes and appearance of various types of losses, primarily financial ones. To prevent that, and to reduce the downtimes as well, one uses reparation technologies, one of which is hard facing. The analysis of the mass losses of the hard faced parts, after certain number of hours of the crusher's field operation, is performed in this paper.

Keywords: Reparation, Hard facing, Hammer, Secondary crusher

1 Introduction

Stable crushers' plants are the process equipment, which are aimed for manufacturing the rock aggregates that are used for producing various types of construction materials (asphalt, concrete, lime, etc.). To reduce production costs, other plants, like the asphalt base, concrete base, lime and cement producing plants, etc. are placed next to the stable crusher plants. Due to the nature of the production tasks, performed on the stable plants for manufacturing the rock (stone) aggregates, this type of plants are located in quarries, so the complete production of the construction materials represent a whole, the so-called small enterprise. The stable crusher plants are also used on the surface mines in the coal mining and ores' crushing, from which are later obtained various metallic or nonmetallic materials, used in different branches of industry.

When the working part becomes worn, to solve the problem usually the two options are considered. They are (i) purchasing the new part and replacement and (ii) cheaper solution – reparation by hard facing. Application of the hard facing for reparation of various damaged parts was proven useful and reliable technique for returning the damaged parts of different industrial systems back in exploitation. Reparation of graders for terrain leveling was considered in [1], blades for asphalt mixing in [2], gears in [3], forging dies in [4, 5], cranks of guide vane apparatus at hydropower plant in [6], rotational knives in [7], various working parts in [8], dredge teeth in [9], etc. Some other problems were considered in several papers, like influence of the sliding speed and working parts' loadings on the degree of wear of the surface layers [10, 11]; influence of the filler metal on the working life of the hard faced or welded parts [12, 13]; influence of different types of aggregates (stones) on intensity of wear of the working parts. Some papers were devoted to problems like influence of microstructure of material, which is exposed to different types of wear on the material's wear resistance [15-18] or structural factors that could influence reduction or increase of the working parts wear [19].

2 The crusher plant, device and function of the tested part and noticed problems

The stable crusher plant consists of several assemblies, which are connected and mutually dependent and which are completing the rock aggregates production process out of various fractions.