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IZBOR OPTIMALNE TEHNOLOGIJE REPARATURNOG NAVARIVANJA UDARNIH GREDA ROTACIONIH DROBILICA

THE OPTIMUM TECHNOLOGY SELECTION OF HARD FACING REPAIR OF ROTATIONAL CRUSHING MILLS' IMPACT BEAMS

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Izvod

U ovom radu se razmatraju osnovni vidovi habanja koji se mogu uočiti na radnim delovima gradjevinskih mašina izradjenih od čelika i livenog gvoždja. U zavisnosti od stepena tog habanja, radni delovi mašina se mogu zameniti novim ili podvrgnuti reparaturnom navarivanju. Teorijski i eksperimentalno posebno je analiziran mehanizam udarnog abrazivnog habanja uzimajući u obzir tvrdoću, mikrostrukturu delova i s tim u vezi otpornost na habanje u laboratorijskim i realnim uslovima.

To predstavlja osnovu za izbor najpovoljnijeg postupka i dodatnog materijala za regeneraciju radnih površina. Eksperimentalni deo rada odnosi se na izbor optimalne tehnologije reparature oštećenih udarnih greda drobilica stenskih minerala koje rade u uslovima intenzivnog udarnog abrazivnog habanja.

Budući da su navedeni delovi izradjeni livenjem od manganskog čelika, to je potrebno odabrati posebnu tehnologiju navarivanja. U tom su cilju najpre izvedena modelska ispitivanja, tako što su na uzorke naneti navari od: čisto austenitne elektrode, austenitno-karbidne elektrode, kao i elektrodama za tvrda navarivanja uz primenu medjuslojne austenitne elektrode.

Tako navarene udarne grede, montirane su na rotor drobilice, puštene u proces drobljenja minerala i povremeno kontrolisane u realnim eksploatacionim uslovima.

Analiziran je stepen pohabanosti nenavarenih i različito navarenih udarnih greda. Na ovaj način bilo je moguće da se ustanovi najpovoljnija tehnologija reparature uzimajući u obzir ne samo tehničke već i ekonomske faktore.

Abstract

In this paper are considered basic types of wear that can be noticed on different parts of the civil engineering machines made of steel and cast iron. Depending on the degree of the wear, working machine parts can be replaced by the ones or be subjected to the reparatory hard facing. Specially was analyzed, both theoretically and experimentally, the mechanism of the impact abrasive wear, taking into account hardness and microstructure of parts and, related to that, resistance to wear in laboratory and real conditions.

This represents the basis for selection of the most favorable procedure as well as the filling material for regeneration of the working surfaces. Experimental part of this work is related to selection of the optimum regeneration technology of the damaged impact beams of the crushing mills for the rock minerals, which operate under conditions of intensive impact abrasive wear. Considering that the mentioned parts are made by casting from manganese steel, it is necessary to select the special hard facing technology. For that purpose, firstly were performed the model investigations, in such a manner that on samples were applied hard faced layers made of: purely austenitic electrode, austenitic-carbide electrode, as well as of electrodes for the hard hard-facing with application of the inter-layer austenitic electrode.

Thus hard-faced impact beams were mounted to the crushing mill rotor, and then they entered the milling process of minerals and were controlled in real exploitational conditions, and the degree of wear was analyzed of the non-hard-faced and variously hard faced beams. It was possible to establish which reparation technology is the most adequate, taking into account not only technical, but also the economic factors.