in protsesse s ekspluatatsyy and vыpolnenyy ahrotehnycheskyh operatsyy.

Dynamycheskye and kvalymetrycheskye parametrы, adaptyvnыe filters, akselerometrы.

The paper investigated on the application of the Kalman filter to enhance the quality the study of the dynamics of mobile machines during their exploitation and implementation of farming operations.

Dynamic and qualitative parameters, adaptive filters, accelerometers.

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Depth and microhardness CONSOLIDATED LASER LAYER FOR INCREASING STEEL 65G wear resistance Soil OF MACHINES

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The analysis, which type of steel producers operating tillage machines used in Ukraine. The properties of the steel due to the laser and the feasibility of strengthening to further increase the durability of appropriate tools various additional measures to ensure the effective implementation of the method of surface laser processing in manufacturing.

The method of surface laser treatment, laser hardening, hardening, welding, wear-resistant carbide powders, steel 65G, working bodies tillage tools.

Formulation of the problem. Before tillage machinery manufacturers one of the priority tasks is to ensure high durability of areas of work that are most exposed to wear. As a result of abrasive wear of working surfaces is a loss of the original form of cutting elements, which increases traction resistance tillage machines and the cost of fuel and lubricants. Also there is a need sharpening or replacing damaged parts.

To strengthen the work of tillage machines method can be successfully applied surface laser treatment. Standing task analysis of laser treatment on the characteristics of steel used in Ukraine relevant manufacturers for the manufacture of such workers as Ploughshares, disc harrows, cultivators, etc. paws. You should also explore the

possibility of applying

surface laser treatment method in practice to improve the durability of products made of steel.

Analysis of recent research. The study on the effects of laser radiation on the surface of various materials in recent years, his writings are engaged scientists and researchers as VP Waco, OG Hryhor'yants, IM Shyhanov and others [6-8]. The last years of publications on the subject of the method of laser treatment for superficial hardening of agricultural machinery is not much [1-5]. Modern publications regarding laser strengthening work of tillage implements including even less of them are scientific papers VP Biryukov, VV Dyvynskoho, V. Crane, VM Bobrytskoho and others [1-4].

The purpose of research - Determine the type of steel used producers in the Ukraine work of tillage machinery, research depth and microhardness laser hardened layer corresponding steel and the possibility of successful application in the production method of surface laser treatment to improve the durability of these workers.

Results. The method of surface laser treatment is currently not yet found its application in our country during the production work of tillage machines.

The study by questioning it turned out that making the data work of those domestic producers as OJSC "Red Star" (c. Kirovograd), SPE "BelotserkovMAZ" (c. White Church), JSC "Umanfermmash" (m. Uman) PE ICC "Veles-Agro" (c. Odessa) and others, in most cases using steel 65G. Therefore, the study of the properties of steel after laser strengthening is important and will determine the possibility of applying this method in the production surface laser treatment. Given that laser strengthening steel so provide higher hardness of the material, the greater the content of carbon steel, it should be noted that the use of laser surface treatment of steel 65G is more effective than other steels with lower carbon content.

The depth of the hardened layer of tillage machines working is an important factor in the wear surfaces and conditions for the implementation samozahostryuvannya.

The greatest microhardness depth hardened layer from the application of laser strengthening of steel 45, L53 65G and 65G steel is because, as mentioned above, it contains most of carbon (Fig. 1) [4].

During the research of laser surfacing materials on cultivating tool steel 65G for spatial control of laser beam scanner used [2]. On the surface coating test samples coated with water-based powder

oksyetyltselyulozy FBH6-2. The average hardness of the material foundations of prototypes was 2200 MPa.

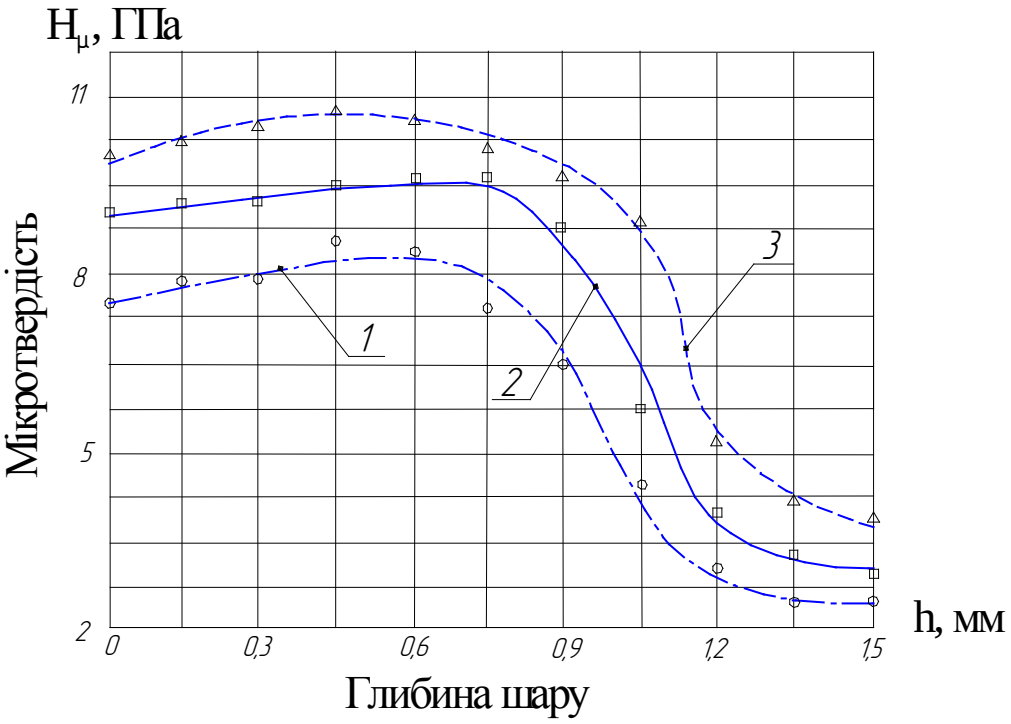

Fig. 1. Distribution of micro hardness in steels after laser strengthening the depth of hardened layer: 1 - 45 steel, 2 - steel L53, 3 - steel 65G (q = 8 · 107 W / m2;τ = 0.3 s).

The laser beam power of 1400 W at a frequency of 200-225 Hz scan led to the formation on the surface of the sample number 1 a modified layer geometric parameters are determined by the heat-affected zone width of 7 mm and a depth of 1.1 mm, a width of 4.5 mm doped layer. The depth of hardening zone with solid state was 0.6 mm and the doped layer - 0.3 mm. Also, while there is a small layer thickness of the deposited powder 0,2 0.3 mm. Geometric heat affected zone for sample number 2 as follows: Zone width - 8.1 mm, width doped layer - 5 mm, overall depth zones hardening, welding doping - 1.35 mm, including alloyed layer - 0.5 mm and the deposited layer 0,3-0,35 mm. Fig. 2 shows the results of investigation of their micro hardness [2]. In the sample number 2 there was a deeper remelting because the cooling rate of the material was lower, which influenced the decrease in microhardness. As a result, the first processing mode (sample number 1) was observed slight change in geometric dimensions. This is important for practical machining, since the surfacing tillage implements cutting edge geometry of the working surface should not be changed.

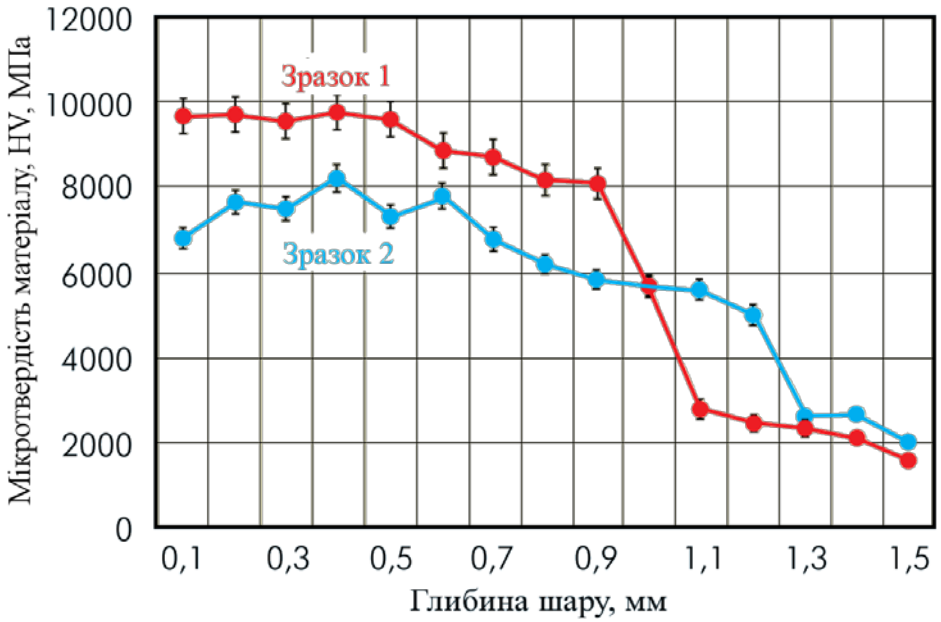

Fig. 2. Dependence of microhardness steel laser depth zone of influence.

Obtained by laser processing surface layer thicknesses (weld alloyed and tempered) sufficient to reduce corrosion and abrasive wear of the surface instruments. Compared to quenching the samples by high-frequency these results in 3-5 times higher, as compared with the same induction welding powder - 3-4 times higher.

We also know that there is a possibility additionally manage the process of laser termozmitsnennya metal using the electrostatic field.As a result of hardening steel 65G without melting under the impact of energy pumping laser active element W = 3,8 KJ formed two zones in the metal surface [9]. The first zone has a structure of martensite, its microhardness is 841 HV0.05. The second zone is a martensite troostyt and its microhardness amounts to 494 HV0.05. The depth of the heat affected zone is 0.04 mm.

As a result of the electrostatic field during laser hardening hardness of the first region increases to 946 HV0.05, and the hardness of the second region does not change and is 501 HV0.05. This depth of heat affected zone increases to 0.08 mm.

As a result of analysis of the microstructure of steels there is a significant increase in depth of hardened zone compared with conventional treatment because of the impact on data steel laser modes close to the melting point and under the influence of the electric field intensity 5 MV / m (Fig. 3) [9].

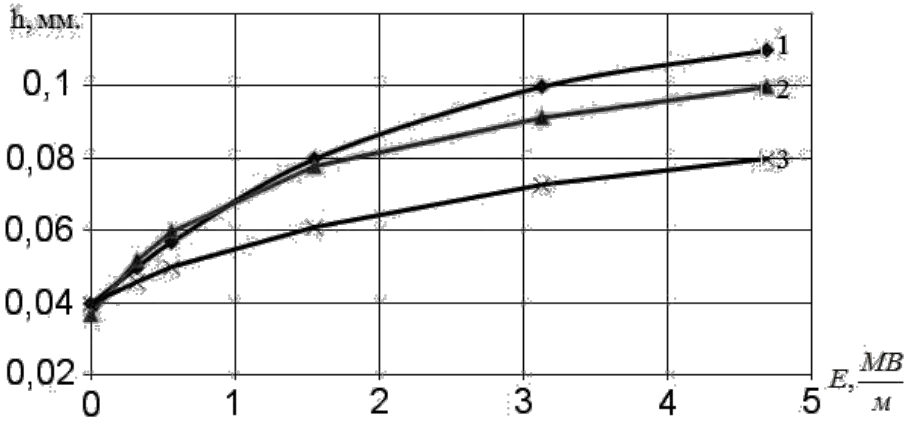

Fig. 3. Dependence of depth of hardened area on the strength of the electrostatic field:1 - Steel 10, W = 3 kJ; 2 - Steel 65G, W == 4,5 kJ; 3 - Steel 65G, W = 3,8 kJ.

The depth zone of laser treatment additionally influenced by such factors as the type of laser technological complex, frequency and time of reinforcement laser and more. In addition, strengthening the effectiveness of the laser greatly depends on the choice of the type of laser. When using fiber lasers strengthen the efficiency of the light emission power laser hardening depth and speed of the product compared to the performance CO2 laser can be increased 12-fold [10], which significantly increases the competitiveness of the method.

Conclusions

Consequently, steel 65G used domestic manufacturers of tillage machines working, can successfully undergo laser strengthening and surfacing that will provide a significant increase in the strength and durability of the tools.

It is established that microhardness of steel significantly affects the depth of laser hardened layer, it should be sufficient to provide the required characteristics relevant working bodies.Use during laser strengthening electrostatic field can significantly increase the depth of the zone of laser treatment.

Effective implementation of the method of surface laser treatment in production can facilitate the use of modern fiber lasers. In the future, for large-scale studies need their support at the state level that will allow for the development of a broad range of specific laser technology to strengthen the working of different tillage machines.

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Proanalyzyrovano, some kind of type of steel workers producer of soil-cultivating machines yspolzuyut bodies in Ukraine. Of research properties were эtoy Due laser uprochnenyya and Ability of application for eschë bolsheho Increase yznosostoykosty sootvetstvuyuschyh leadership raznыh dopolnytelnыh mayor with a view Introduction Provision successful method poverhnostnoy Laser obrabotku in production.

Method poverhnostnoy obrabotku Laser, Laser ukreplenye, zakalyvanyya, surfacing, yznosostoykye carbide powders, steel 65G, Rabochie orhanы soil-cultivating leadership.

It is analysed, what type of steel is used in Ukraine by the producers of working organs of soil-cultivating machines. Properties of this steel after the laser strengthening and possibility of application of different additional measures are investigational for the yet greater increase of wearproofness of corresponding instruments with the purpose of providing of the successful applying in industry of method of superficial laser treatment.

Method of surface laser treatment, laser hardening, hardening, welding, wear-resistant carbide powders, steel 65G, working bodies tillage tools.

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OPTIONS TECHNICAL EQUIPMENT cooperatives KORMOZABEZPECHENNYA dairy farm family type

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The method of study options cooperatives with technical equipment kormozabezpechennya dairy farms of family type. The expediency of creation of cooperatives for agricultural productionkormozabezpechennya family dairy farms. The dependences need areas for growing fodder crops from livestock dairy herd. Grounded options kormozabezpechennya technical equipment for dairy farms of family type.

Dairy cattle, kormozabezpechennya system parameters, technical equipment.

Formulation of the problem. The efficiency of milk production on farms of family type largely depends on the system kormozabezpechennya [1]. At the same time, remains unresolved scientific and applied problems concerning justification parameters of technical equipment of cooperatives kormozabezpechennya dairy farms of family type for specific areas (administrative districts, town councils, etc.).

Analysis of recent research. The issue of justification options kormozabezpechennya individual dairy farms devoted to a series of scientific papers both domestic [2] and foreign scholars. [3]

The analysis of these studies shows that they do not take into account the geographical location of fields of forage crops. With the growing population of dairy cattle growing need for feed and field areas for growing fodder crops, increasing the distance from them to the dairies. At the same time the cost of transport processes (delivery of seeds and fertilizer, transport crop of forage crops, etc.) to increase the number of dairy herds also increase.