5. *A. Sinyavsky* Magnetic treatment of potato tubers / A. Sinyavsky, V. Savchenko // Annals of Warsaw University of Life Sciences - SGGW. - Agriculture (Agricultural and Forest Engineering). - Warsaw: 2011. - № 57. - P. 57-64.

Pryvedeny of research results Changed byopotentsyala rostkov semyan cucumbers at a obrabotku s magnetic field. Ustanovleny dependence Changed byopotentsyala from mahnytnoy induction and velocity of motion semyan a magnetic field. Opredeleny most эffektyvnye regimes processing.

Byopotentsyal, ohurtsy, Magnetic induction, movement velocity semyan.

The results of studies of changes in biological potentials sprouts cucumber seeds as they are processed in magnetic field are described. The dependence of biological potentials on magnetic induction and speed of seeds in magnetic field are determined. The most effective treatment regimes are identified.

Biological potential, cucumbers, magnetic induction, speed of seeds.

UDC 621,794

SEQUENCE DETECTING DAMAGE AND DEFECTS ON THE SURFACES

SS Karabynosh, Ph.D.

The conceptual foundations for further technical support as repairs and maintenance of vehicles. The analysis and determined implementation of technological bases of holographic methods for improving the operational safety and reliability of machines in the course of farming operations in crop and livestock production.

Details svlskohospodarski machine damage, defects, holography, flaw detection, diagnosis, non-destructive testing, laser, optical system.

Formulation of the problem. Study damage and defects, determine the parameters of acceptable or marginal conditions, the impact of the change of the surface state of parts of the main types of loads carried on two custom designed plants that provide the necessary parameters of interaction (type of load, type of interference fields, their

location, configuration, etc.). Computer holography (the main type of the studies) allows you to register a change surfaces at low loads, which with low speed state changes cause mikrodeformuvannya.

Analysis of recent research. Based on previous studies conducted and analysis of the literature [1, 3] Existing methods and technical means holohrafuvannya that affect the quality of processes and diagnosing flaw in the implementation of modern technologies perform service work. The image of the deformed body, represented as colored interference fields, fixed in memory [1, 2, 4].

Problems nondestructive testing, technical diagnostics considerable attention in their work paid scientists: AN Guz, LM Lobanov, VA Trinity, VA Pyvtorak, JK Bondarenko AA Stories, SP Tymoshenko, MN Belyaev, DA Drayhor, IP Blond, VV Klyuyev and others. Despite the successes and achievements of practical skills, at present no data of studies on the technical condition of parts, components, assemblies or machines in general, the various types of load (single or aggregate operating) to the study of three-dimensional surface layers fields mikrodeformuvannya

The purpose of research. To investigate the feasibility of holographic methods and develop a methodological basis flaw detection and diagnosis of injuries and hidden defects on the surfaces of parts of agricultural machines.

Results. Analysis of possible ways of further improving the efficiency of agricultural technology in crop and livestock production indicates the introduction of new technologies promise fulfillment service works using holographic techniques. Generally used in research such types of load: mechanical (tensile, compression, torsion, bending and integrating them); local ventilation, general termoradiatsiyne; acoustic excitation; load pressure or vacuum, and for the destruction of samples load stroke, as recommended special literature [2, 3].

Research conducted at facilities for Holography dvoimpulsnoyi speckle interferometry and its manifestation computer. In the first case (Fig. 1) beam of coherent light emitted by laser 1 passes through a collimator formed by two lenses: curved diameter of 25 mm focal length - 20 mm (2) and convex with a diameter of 90 mm and a focal length of 200 mm, mirrors 4, 5, 6, 7, comes to rozsiyuchu lens 8 with a diameter of 100 mm focal length - 600 mm and is aimed directly the surface of the object, the details provided by the regulator 13. Special provisions lenses can provide observation top and side surface of the product using a mirror 10. under these conditions, 65% of the intensity of light falling on top of it.

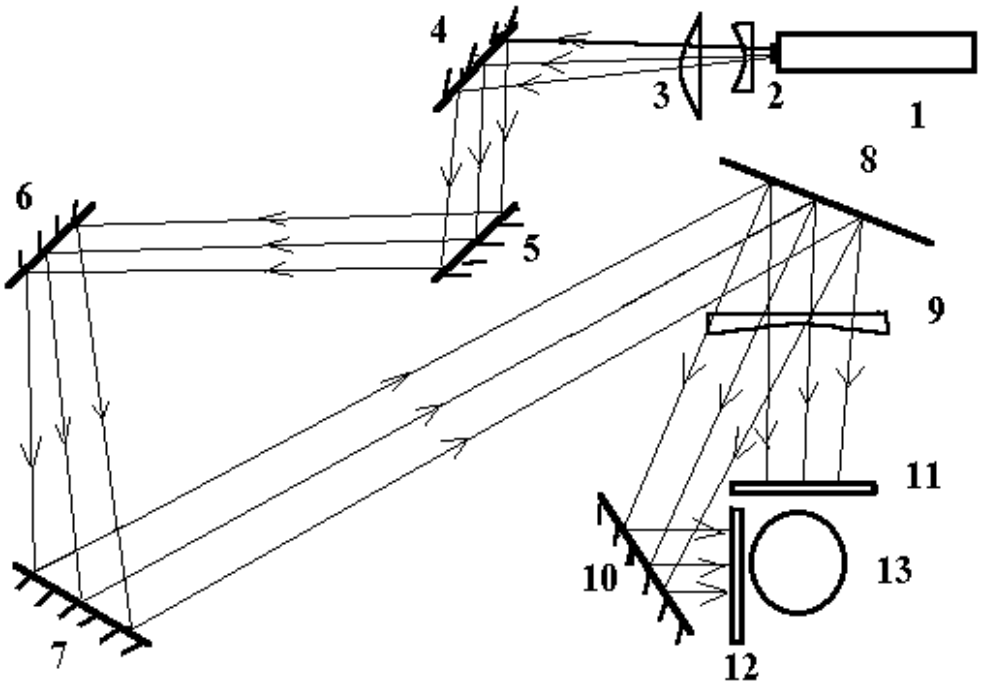

Fig. 1. Optical scheme holography research dvoimpulsnoyu 1 - laser; 2, 3, 9 - lenses; 4, 5, 6, 7, 8 and 10 - mirrors; 11 12 - shields; 13 - product or part.

To record holograms used methods offered by JN And Denysyuk PM Bune [1, 5]With fixing film on special protective screens 10 and 11 are located directly in front of the object 13. The hologram recording was carried out using a ruby laser dvoimpulsnoho "Lumoniss" HL 32 JK Lasers, the film company AGFA sensitive to coherent red light. Samples or parts that have insufficient or excessive reflex ability, and covered with special paint applied to their grid. The study was conducted in dvoimpulsnomu mode by changing the exposure time of 1 NC 120 NC. Conditions of the experiment were supplied with specially created to enable laser device (patented) in the corresponding set points (Fig. 2). Dvoimpulsnoyu holography investigated the presence of external and subsurface defects in detail, which was made of steel, cast iron, plastic, Metallpolimers, nonferrous metals, and more.

The main type of mechanical load served, and additional acoustic excitation and local thermal heating selected areas of detail to establish the parameters of acceptable technical condition. This type of fitting used to fix the holograms with details of significant dimensions that must, under safe conduct research and experimental works, place away from sources of coherent light - laser. The use of side mirrors 10 to record the hologram also from the side surface of the part, extending the measurement range of the technical state of the product. The use of a considerable number of mirrors due to the need for research real parts of

agricultural machines with significant size and experimental work indoors are limited.

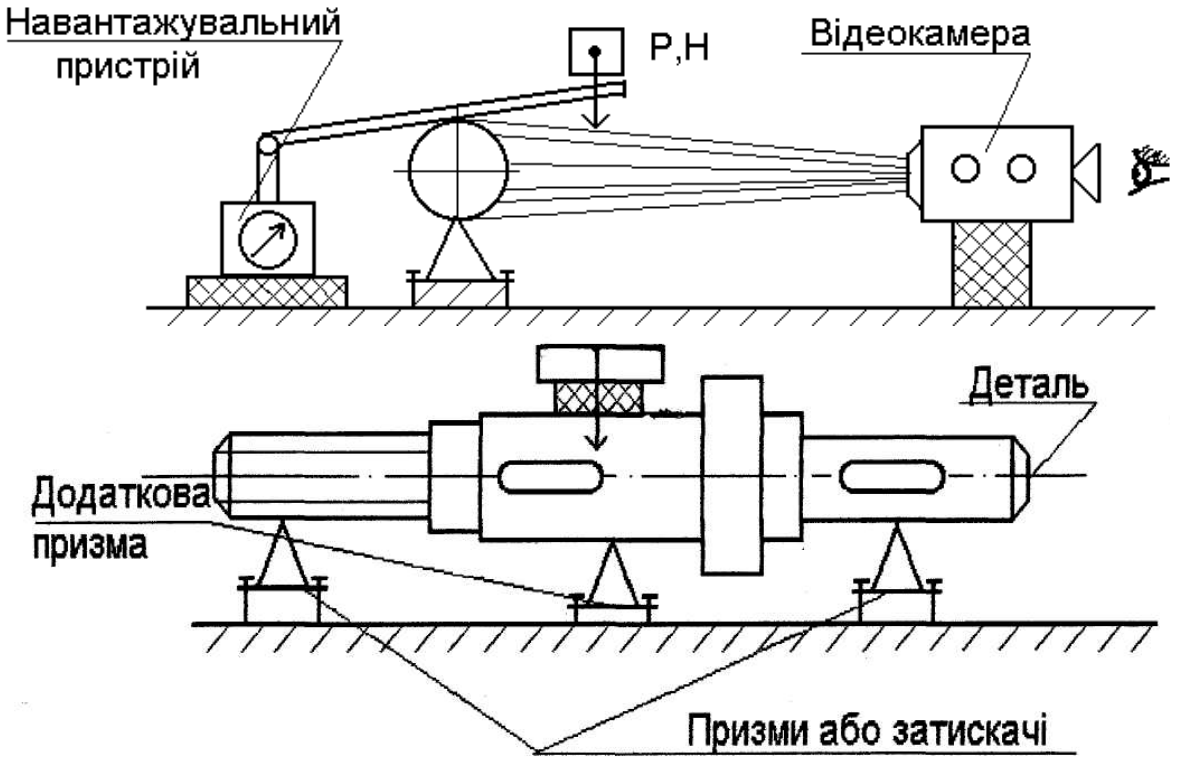

Fig. 2. Scheme devices for loading parts mechanically (compression and bending).

Software ORTIMA or FD - 63 allowed for research dopomphoyu computer and laser systems to create color holographic images - holograms - interference field surfaces deformed body. Recording system computer holograms improved by installing additional optical elements, allowing you to explore the surface of agricultural machines diffusely reflecting coherent light.

The study was conducted on a specially prepared parts made of different materials, with existing defects or damage (if necessary artificially given to them). As the materials studied, using cast iron and steel plates and cylinders, parts of non-ferrous metals, wood blocks, plates reinforced plastics, Metallpolimers, steel plates coated with kompozytyvamy of them resistant to wear and outside impacts powder materials, etc. . In the study used real details of agricultural machines both new and those that have been in operation. As long as it was necessary to conduct a quantitative estimation of the stress strain state of the surface details on their surfaces deposited into the physical distance between the lines that ranged from 10 to 20 mm, depending on the dimensions of the details.

Chart device for mechanical load compression or bending shown in Fig. 2. Each sample loaded. This was developed special adaptations that made it possible to obtain satisfactory condition at holohrafuvanni parts of agricultural machines, which have specific characteristics of the surface layers, which differ in their structure, roughness, hardness from similar parts of general engineering. For iron and steel samples or actual parts used loading installation, which enables the device through a special mechanism to fix the size of the load. Samples or parts rigidly held at prisms or terminals, which in turn were recorded on a special vibration table of reinforced concrete. Stretching sample was performed using a special screw device equipped with a dynamometer. Parts or sample one end fixed firmly in the grip, and the free - were attached movable clamp screw mechanism. Chart device shown in Fig. 3.

If the experiment conditions required for the implementation of joint action product of different types of loads, it was envisaged changeover system design devices themselves, as well as the structure of the table. Characteristics of tasks required loads are given in Table. 1.

To reduce the amount of experimental work previously for each type of material held ten series of experiments on the effect of limiting the definition of equipment and devices. The criteria for evaluation of the possibility of serving the onset of visual observation and a clear manifestation of interference lines on the screen.

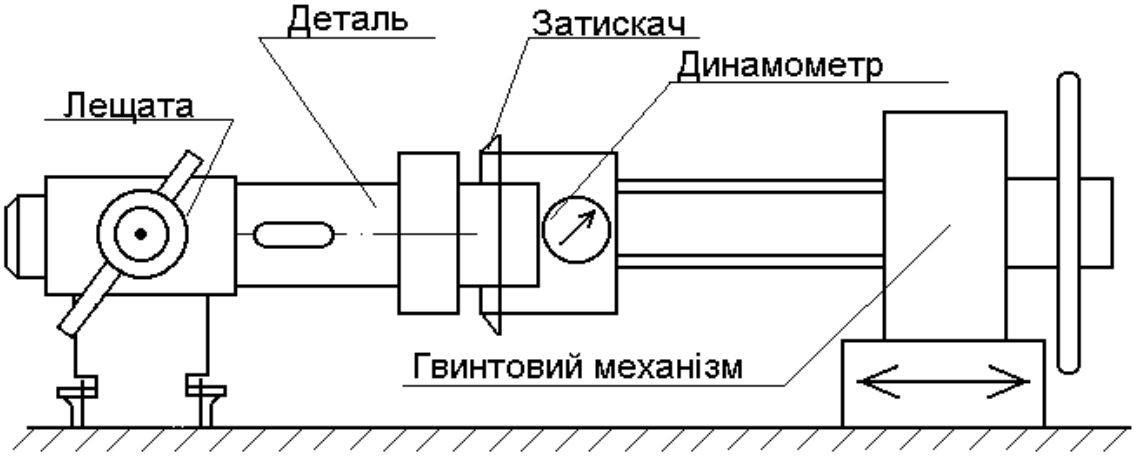

Fig. 3. Apparatus for creating tensile efforts in detail (mechanical load).

To resulted in tab. 1 results maximum image intensity was observed for the middle range of the scattering data search ±8 - 10%, which satisfy the conditions of the experiment. The appearance of interference lines - the lower limit, and their disappearance - the upper limit of experimental research.

1. The values of the mechanical load of parts from different materials.

Material of the (standard)	Type of mechanical load			
	Spread, F, H	compression, F, H	Bend, F, H	Torsion, M N m
Iron, MF-18	200-250	150-200	250-300	10-15
Steel 40X	250-300	200-250	350-400	20-22
The polymer (polyethylene, polyamide)	10,0-22,0	5,0-7,0	15-22	0.1-0.3
Aluminium, AL9	16-18	24-27	19-28	0.5-0.7
Wood (oak block)	18-22	27-40	30-40	2,1-2,4
Reinforced metal-polymer	20-25	15-22	30-35	2,7-3,0
Aluminum	100-120	60-80	150-180	7,0-9,0

Gradually load or discrete steadily, reaching occurrence in real time (on the monitor) a clear picture with high contrast and intensity images and recorded it in the computer. Knowing the actual size of the part or parts of it, compared with the received hologram and conducted research and measurement.

With the optical system setup and change of the resolution lens camera changed the size of the observation plots. The study was conducted with interchangeable lenses, making it possible to study objects ranging in size from 40×40 to 800 mm×950 mm or more, which indicates the ability to control a wide range of parts and components of agricultural machines. The use of optical equipment limited capacity of the laser, the size of the desktop and reflexive ability of the details.

Conclusion. Thus, defects can appear on any body surface unlimited product have different depth, orientation, size detection, geometric dimensions, configuration and more. Detecting defects and damage using conventional methods is quite complicated. It was established that the combination of two types holohrafuvannya gives a hundred percent result in finding hidden defects. The best results are obtained when using complex load, simultaneously with the implementation of two or even three different in their physical nature types of loads.

List of references

1. Boone R., Vanspeybroeck pH., Karabinesh S.S. Brittle crack propagation in plastics pipes analyzed by holographic interferometry. 1993 / R.Boone, Rh.Vanspeybroeck, S.S.Karabinesh. - Brussels, Nondestructive testing and image processing, S.S. - Session 5. - P. 325-334

2. *Karabinesh S.S.* Structurally-technological methods providing of reliability of agricultural technique by computer holography. 2012 / S.S. Karabinesh. - Motrol, 14 - №3. - P. 112-119.

3. *SS Karabynosh* Definition velychynы mykrodeformatsyy nahruzhennoho PE holographic method / SS Karabynosh. -M .: Control. Diagnosis.-2008.-№ 4. - C. 35-41.
4. *SS Karabynosh* Methods for determining tense in detail in the Implementation holographic methods of research.2013/*SS Karabyn.*- MOTROL, Vol. 15. - No 3. - P. 183-189.
5. *SS Karabynosh* Defektы. INJURIOUS details. Methods for determining s. 2013/*SS Karabynosh*. - Saarbruken, Germany, Palmarium Academic Publishing. - 89 p.

Razrabotanы kontseptualnыe Fundamentals dalneysheho Provision of technical quality of service and conducting repairs of machines. Conducted analysis and ustanovlenы Technological Fundamentals Implementation holographic methods at эkspluatatsyonnoy Increase reliability of machines and bezotkaznosty in the process ahrotehnycheskyh perform works in rastenyevodstve and animal husbandry.

Details, selskohozyaystvennыe Machines, INJURIOUS, defektы, holography, malfunction, diagnostics, nondestructive control laser.

Conceptual foundations for further technical support as repairs and maintenance of machines are detemsned. Development of technological basis for implementation of holographic methods for improving operational safety and reliability of machines in the course of farming activities in crop and livestock production.

Details, agricultural machinery, damage, defects, holography, flaw, diagnostics, non-destructive testing, laser optical system.

UDC 655.3.022.1

Rational methods of restoration parts TECHNOLOGICAL EQUIPMENT

VA Kochanowski, Ph.D.
National Technical University of Ukraine
"Kyiv Polytechnic Institute"
VV Korobskyy, Ph.D.
National University of Life and
Nature Ukraine

The method of calculating rational way of restoring parts of the process equipment based on the position of material and economic feasibility of repair parts.