of the joint 14/12 mm or 16/14 mm, so the diameter of the neck is always less than the lower part of the cone under the ball part of the joint. The extractor is compact – it consists of only two separate parts, which is definitely its advantage.

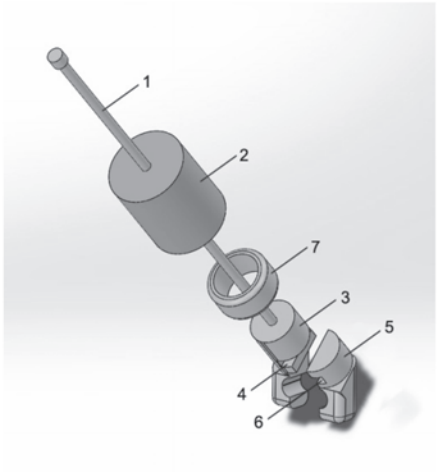

Fig. Extractor for the stem of artificial femoral joint

The figure shows the structure of the extractor for the leg of the endoprosthesis of the artificial hip joint, containing a guide rod 1, a sliding hammer 2, a housing 3 for mounting at an angle that creates action coaxially with the axis of the endoprosthesis of the artificial hip joint, with grooves 4 covering half the diameter of the neck of artificial hip joint, a pad 5 with corresponding grooves 6, which covers the second half of the diameter of the neck of the endoprosthesis of the artificial hip joint, and a locking ring 7 for fixing the fastened position of the body and the pad through the grooves.

In order to extract the endoprosthesis of the artificial hip joint, access to the endoprosthesis is performed. The body of the proposed device is brought under the neck of the endoprosthesis, covered with an overlay, and fixed with a locking ring, after which the leg of the endoprosthesis of the artificial hip joint is removed with a sliding hammer. Therefore, the presented extractor allows you to effectively extract the leg of the endoprosthesis of the artificial hip joint, it is convenient, compact, easy to use, which significantly saves time for surgery.

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COMBINATION OF SEVERAL EFFECTS EXPLAIN THE REJUVENATING AND INVIGORATING ACTION OF AUTOMATIC VIBRATIONAL MASSAGE

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Automatic massage has been demonstrated to produce the invigoration, restoring, and healing effects on the human's body. It has been used for patients with anemia, arthritis, muscle injuries, hematomas.

We tried to find the physical explanations for the effects produced by the automatic massaging machine on different parts of the body.

Depending on the position of a patient on the vibratory platform, different parts of the body are subjected to the action of mechanical vibrations with amplitude of approximately 6 mm. In first case, the abdomen and thorax were affected by low frequency (720 vibrations per minute) mechanical vibrations, generated by automatic massager. After analysis of the obtained results, we have concluded that the vibratory massage increases the cardiac output of the heart and, as a result, the increases the volume of blood circulating through the vascular system of a patient.

In the second case, the low extremities were primarily subjected to the automatic mechanical vibrations. After analysis of the obtained results on the arterial blood pressure, we have concluded that the automatic massage increases the effective size of vessels of low extremities and the

peripheral resistance of systemic circulatory system, and thus, improves the circulation of blood through the body providing the nutrients and oxygen to the injured tissues.

By combining different positions on the vibrational platform of the automatic massaging machine, patient may adjust the massage session to the most suitable for him mode and reach a desired healing effect in a shorter period of time and in the most effective way without any complications. For instance, some patient with high blood pressure may avoid a sedentary position during the massage because the latter increases the load on the heart. The standing position may be preferable in some cases for its cumulative effect on the heart and vessels.

Tkachuk I.G.

CREATION AND PROPERTIES OF PHOTOSENSITIVE n-SnS2 / p-InSe HETEROSTRUCTURES

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Currently, heterojunctions based on thin films are quite interesting and promising in terms of manufacturing new heterostructures. The n-SnS_2 / p-InSe heterojunction is no exception.

Indium monoselenide InSe by the value of the band gap Eg = 1.2 eV refers to suitable materials for photoelectric energy conversion under terrestrial conditions. The layered structure of InSe crystals with a weak Van der Waals bond makes it easy to make substrates for heterostructures and eliminate the need to cut ingots into plates and their mechanical and chemical processing. Indium selenide uses photosensitive and diode structures of various types: Schottky barrier, p-n junctions and heterojunctions.

n-SnS_2 / p-InSe heterostructures are known to be created by the method of landing on optical contact with the occurrence of the inversion layer in p-InSe. Thin films of tin sulfides (SnS, SnS_2, Sn_2S_3) are characterized by different phase composition, which determines their basic physical properties. SnS_2 tin disulfide films with a band gap width Eg ≈ 2.45 eV are suitable for the manufacture of the front layer of photodetectors based on heterojunctions. SnS_2 film contains the chemical elements Sn and S, which are widespread, low cost and low toxicity.

To obtain n-SnS_2 / p-InSe structures, bridgman crystals of indium selenium p-type conductivity were used. For the hole conductor was doped with an admixture of Cd (0.1% by weight). According to the study of the Hall effect, the concentration of charge carriers was p »1014 cm^{-3} and their mobility perpendicular to the axis of symmetry C in InSe at a temperature of 295 K was equal to $\mu_p H \approx 50$ cm^2 / Vs. n-SnS2 / p-InSe heterostructures were prepared by applying ~ 0.3 - 0.4 μm thick SnS_2 films to the surface of p-InSe substrates heated to T_S = 350 °C by spray pyrolysis at atmospheric pressure of 0.1 M aqueous solutions of tin (IV) chloride pentahydrate Sn •$5H_2O$ and thiourea $(NH_2)_2CS$.

As a result of this work and data measurement, the diode properties of the structures were found to be determined by the difference between the energy parameters of n-SnS_2 and p-InSe and the energy barrier of the tunnel-thin layer In_2Se_3 with temperature-independent height qφB ≈ 0.5 eV. At direct displacements V <0.6 V (T (290 K), the main mechanism of current flow is the tunneling of electrons from the bottom of the n-SnS_2 conduction band through the barrier to states in the forbidden region of p-InSe, followed by recombination with valence band holes.

At direct voltages V> 0.6 V (T (290 K) the decrease of external voltage is concentrated on the high-impedance base region p-InSe and the space charge limit mechanism is realized. With increasing temperature, the voltage of the space charge limit increases to V = 1.6 V (T (330 K). The reverse current in the range of investigated voltages - 3 V <V <0 V in the heterostructure n-SnS2 / p-InSe is formed by tunneling electrons from the bottom of the conduction band and energy states of the band gap E_{C2} - E_F = 0.3 - 0.4 eV p-InSe in the conduction band n -SnS_2 through the energy barrier formed In_2Se_3.

A wide range of quantum efficiencies of n-SnS_2 / p-InSe 1.2 - 3.2 eV heterostructures contributes to the prospect of their use as photodetectors, providing that the non-photoactive absorption of light in the n-SnS_2 film is reduced.