during the absorption of one high-energy quantum is determined by the probability of its absorption by chemical elements that are a part of a chemical compound of the single crystal - the so-called ionization energy of the electron-hole pair - is a useful signal. Dark current of the detector is noise for such a system. Most efforts to increase the signal-to-noise ratio are aimed at reducing dark current, because increasing the useful component of the signal requires a change in the material of the base single crystals.One of the ways to reduce dark current of the structure is to increase the resistivity of the material, which is achieved by the technology of obtaining single crystals (the presence of its own defects in the crystal lattice, the method and depth of doping). Another way is to choose the mode of operation of the device, which is determined by the technology and nature of electrical contacts of the studied structures. The technology of creating electrical contacts determines their type and mechanisms of current transfer through the structure, which, together with the technology of obtaining single crystals, affecting the value of their resistivity, changes dark current of the structure. The main material for semiconductor detectors of X- / γ-radiation with an extended range of quantum energy (up to ~ 1 MeV and above) in comparison with silicon detectors is CdTe and solid solutions based on it. The first reason for this is that the band gap Eg of cadmium telluride is sufficient to use detectors at room temperature without significant thermal generation of carriers. The second reason is high density of the compound and a large atomic number of its elements providing conditions for effective detection of X / γ radiation. Finally, high radiation resistance of broadband II – VI compounds, compared to other commercially available semiconductors (Ge, Si, III – V compounds), allows the operation of devices based on them in conditions of harsh irradiation. CdTe-based solid solutions are one way to improve spectral resolution.Significant progress has been made in the production of detectors based on semi-insulating CdTe single crystals with good spectrometric properties in the form of diodes with p-i-n structure and Schottky diodes. However, high-energy resolution radiation detectors based on cadmium telluride with Schottky contacts show instability with long-term application of bias voltage due to the phenomenon of polarization. The stability of functional parameters is a critical factor for the practical application of electronic devices. The ability to form metal-semiconductor contacts with the desired properties (ohmic or blocking contacts) is a key requirement in the manufacture of cadmium-based detectors. That is a reason of great practical importance in the development of new technologies for the manufacture of high quality electrical contacts.

Makhrova Ye.G.

EXTRACTOR FOR THESTEM OF ARTIFICIAL JOINT

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In case of shaking of an artificial femoral joint, or in case of occurrence of a bone crack in a place of installation of an artificial joint there is a necessity of its full replacement. For this operation it is necessary to have a convenient, easily installed clamp that covers the neck of the endoprosthesis' leg and allows you to quickly remove the hinge.

Existing devices are imperfect, require the use of auxiliary tools to install and fix the device, which covers the neck of the endoprosthesis' leg in the landing area of the endoprosthesis' ball of the femoral joint. This requires additional operating space, as the socket wrench has its large physical dimensions and is directed coaxially with the axis of the cone, which does not coincide with the main axis of the endoprosthesis of the artificial hip joint, and therefore with the axis of the main tool rod.

Such designs create certain inconveniences associated with the use of auxiliary tools and the possibility of failure of the device from the cone during extraction, and consist of many sufficiently small tool parts, and if any of them is lost, it can't be used functionally any more. Some of them are quite complex to be made and expensive.

To eliminate these shortcomings and their negative impact, an extractor for the leg of the artificial hip joint was developed, which is represented in the figure. It is known that the neck of the endoprosthesis of the artificial hip joint has a diameter of 13 mm, and the cones under the ball part

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.

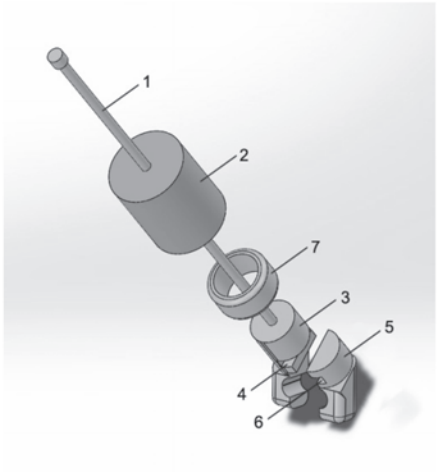

Fig. Extractor for the stem of artificial femoral joint

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.

Nahirniak V.M.

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