

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ  
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ

ІНФОРМАТИКА, МАТЕМАТИКА,  
АВТОМАТИКА

**ІМА :: 2017**

**МАТЕРІАЛИ  
та програма**

НАУКОВО-ТЕХНІЧНОЇ КОНФЕРЕНЦІЇ

(Суми, 17–21 квітня 2017 року)



Суми  
Сумський державний університет  
2017

## Piezoelectric Transducers for Ultrasonic Surgery

Bazilo C.V.<sup>1</sup>, Ph. D., Zaika V.M.<sup>1</sup>, Ph. D., Bondarenko Yu.Yu.<sup>1</sup>, Ph. D.,  
Petrushko Yu.A.<sup>1</sup>, Fedoruk L.O.<sup>2</sup>

<sup>1</sup>Cherkasy State Technological University, Cherkasy, Ukraine

<sup>2</sup>Cherkasy Hospital #3, Cherkasy, Ukraine

The main method of preventing of serious infectious complications of gunshot wounds is a primary surgical treatment of wounds. In most cases, surgical interventions followed by infections which cause diseases of soft tissues that develop in the form of inflammatory processes and others. Research and development of methods to reduce blood loss, wound healing acceleration and postoperative resorption of scars are one of the biggest challenges in medicine, which ultrasound helps to solve.

The use of piezoelectric electromechanical elements as a source of ultrasound for ultrasonic surgery is perspective.

A new connection scheme of piezoelectric elements is shown Fig. 1. It consists of cutting tool 1, piezoelectric elements 2, 3, and generator 4.

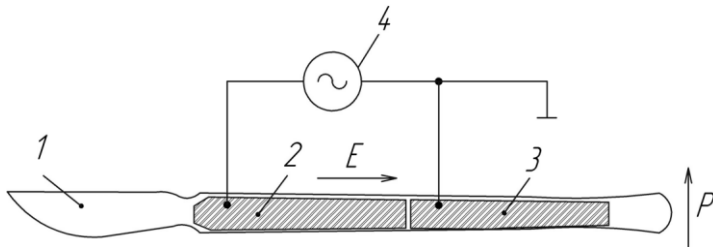


Figure 1 – Connection scheme with piezoelectric elements

To enhance the acoustic oscillations it is proposed to place piezoelectric elements on a scalpel in such way to have an angle between the electric field vector of the excitation voltage and the polarization vector.

Received information can be used in designing of piezoelectric electromechanical transducers for ultrasonic surgery.

1. C.V. Bazilo, Yu.Yu. Bondarenko, V.M. Zaika, Yu.A. Petrushko, L.O. Fedoruk, Patent of Ukraine, u 2016 13588, 29.12.2016.