Electrically controllable acoustic impedance matching system

UNIVERSITÀ DEGLI STUDI FIRENZE

INVENTORS: Federico Carpi
Gabriele Frediani

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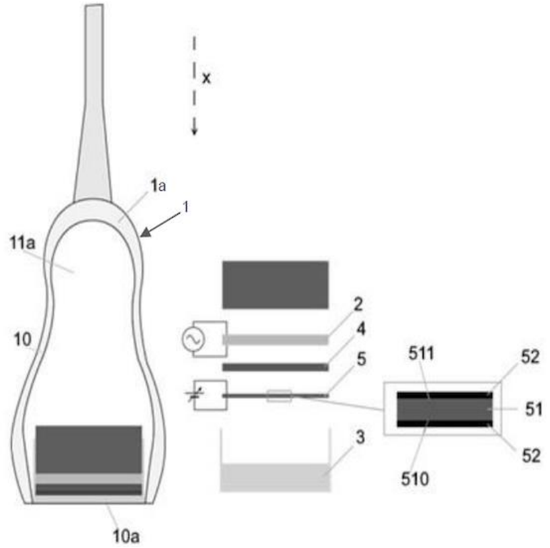
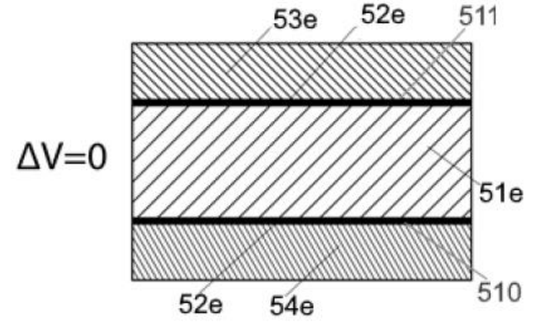
Invention

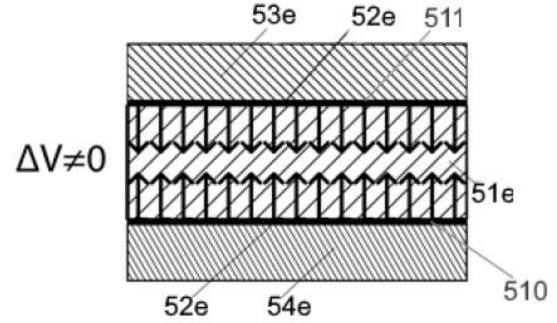
The invention refers to the sector of non-invasive investigations by means of ultrasound, both in the medical field and in the structural field of materials or objects.

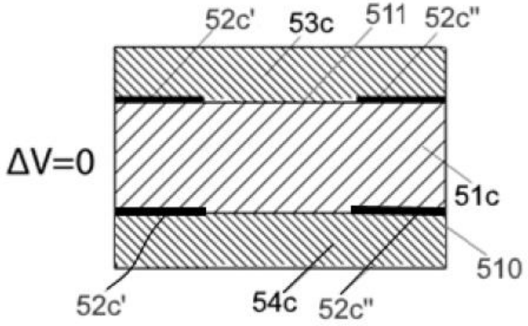
The patented system surpasses known systems, having acoustic impedance matching layers with predetermined and therefore optimal characteristics only over a limited frequency range around a predetermined value. The present invention provides a system that, by means of an electrical control signal, allows dynamic and active adaptation of the impedance in a variable frequency range. The system comprises at least one electroactive polymer layer which allows to dynamically adapt the acoustic impedance of the transducer with an external means.

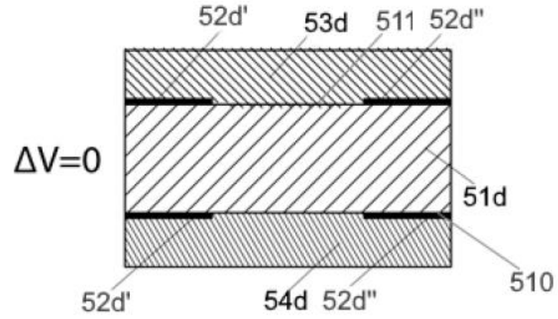
Drawings & pictures

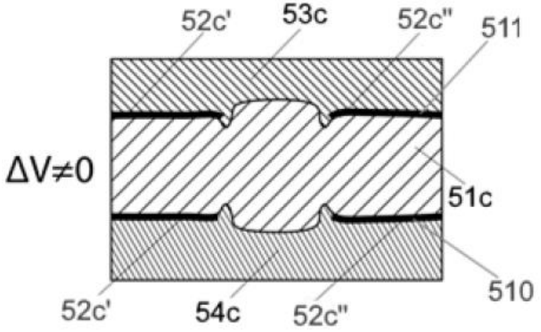


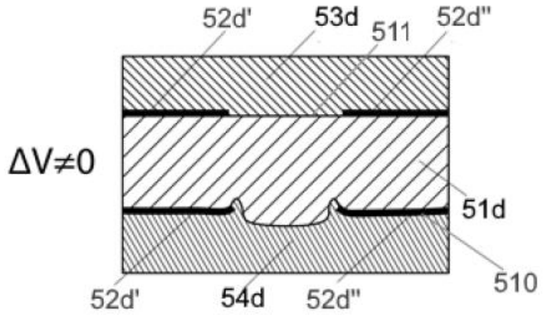












Industrial applications

The invention can find application in the medical field, for example for the construction of components for non-invasive clinical diagnostics using ultrasound images, as well as for the construction of new ultrasound therapeutic machinery.

Outside the medical field, the system and the device that implement it can be usefully used in quality control to perform non-destructive investigations of materials and objects.

The advantages of the invention lie in the possibility of responding effectively and in real time to variations in the transmission conditions of the acoustic wave, due for example to the need to investigate structures at different depths, also allowing the reduction / correction of reading errors from which the acoustic signal received in real time is affected.

Possible developments

The patent is available for definitive assignment, as well as for an exclusive and non-exclusive license. The licenses are available for the entire remaining term of the patent titles.

The research group is available for new research activities in collaboration and on behalf of third parties, technical insights, scientific advice, also aimed at raising the TRL of technology.

The TRL of the invention is 5. Currently, a technological maturation loan funded with the POCArno call from the University of Florence and MISE is in progress.

For more information:

Tech Transfer Office of the University of Florence

Headquarters: Piazza S. Marco 4 – 50121 Firenze

Web site: www.unifi.it

E-mail: brevetti@unifi.it

For more information:

Ufficio Regionale di Trasferimento Tecnologico

Headquarters: Via Luigi Carlo Farini, 8 50121 Firenze (FI) Italy

E-mail: urtt@regione.toscana.it

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urtt Ufficio Regionale di Trasferimento Tecnologico