(SD2022-119) MICROELECTRODE GRID WITH A CIRCULAR FLAP FOR CONTINUOUS INTRAOPERATIVE NEUROMONITORING

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ABSTRACT

Researchers from UC San Diego and Oregon Health Science Univeristy developed a microelectrode grid for continuous interoperative neuromonitoring. The microelectrode grid includes a flexible substrate with low impedance electrochemical interface materials on conducting metal pads. The metal pads are connectable to stimulation/acquisition electronics through metal lead interconnects forming stimulation and recording channels and eventually to bonding pads. A flap within the substrate is movable away from the remainder of the substrate while at least some of the metal pads on the remainder of the substrate can remain in contact with an organ when the flap is moved away from the remainder of the substrate.

FULL DESCRIPTION

Background.

The ECoG grids are conventionally used before resecting the brain tissues to delineate the functional and diseased boundaries. Together with the pre-surgical fMRI, the ECoG functional mapping is a powerful tool the neurosurgeons use to distinguish pathological tissues from healthy tissues and determine the resection boundary. However, the conventional ECoG grid does not provide cIONM because the electrode blocks the surgical field.

Researchers from UC San Diego and Oregon Health Science Univeristy developed a microelectrode grid for continuous interoperative neuromonitoring. The team of researchers have revolutionized the ECoG neuromonitoring practice by allowing cIONM while functioning as conventional ECoG grid and recording in the regions surrounding, and if desired within, the resected tissue.

The invention is related to a novel electrophysiological grid, a new form of electrocorticography (ECoG)

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OTHER INFORMATION

KEYWORDS

cortical, electrocorticography, functional neurosurgery, high resolution, intraoperative, mapping

CATEGORIZED AS

- **Imaging**
  - Medical
- **Medical**
  - Disease: Central Nervous System
  - Imaging

RELATED CASES

2021-Z08-1

microelectrode grid, part of which can be displaced from the tissue while the other parts of the grid remain in intimate contact with tissue: This is accomplished with a foldable flap structure that allows part of the grid to be flipped back away from tissue and then placed back on tissue when needed. This approach enables the continuous intraoperative neuromonitoring (cIONM) of the brain state and its activity during the resective neurosurgery. The flap located on the grid can be opened and closed, allowing the surgical tools to access and resect the brain tissue through the inner window of the microelectrode. The surrounding microelectrode recording channels outside the circular flap region are capable of continuously monitoring the ECoG activities during the entire neurosurgery. The capability to do cIONM and provide live feedback to the neurosurgeon are crucial in preserving essential functions on the human brain and may improve patient outcome.

INTELLECTUAL PROPERTY INFO

This technology is patent-pending. US patent rights are available for commercial development.

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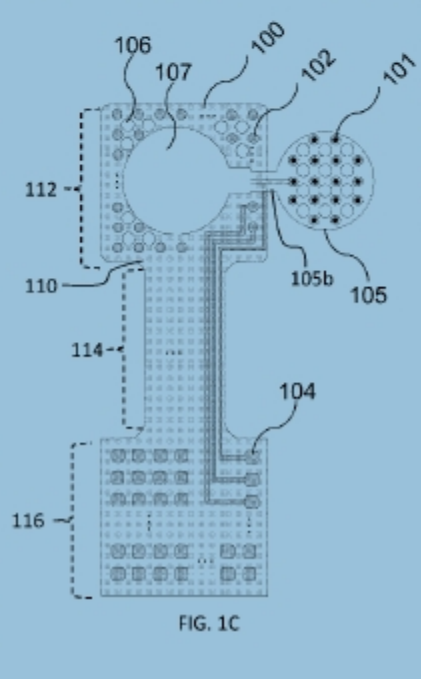

FIG. 1C

(57) **Abstract:** A microelectrode grid for continuous interoperative neuromonitoring includes a flexible substrate and a plurality of low impedance electrochemical interface materials on conducting metal pads on the substrate. The metal pads are interconnectable to stimulation/acquisition electronics through metal lead interconnects forming stimulation and recording channels and eventually to bonding pads. The interconnects are insulated with dielectric. A flap within the substrate is movable away from the remainder of the substrate while at least some of the metal pads on the remainder of the substrate can remain in contact with an organ when the flap is moved away from the remainder of the substrate.

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RELATED MATERIALS

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