



TECHNOLOGY

SYSTEM, APPARATUS AND METHOD FOR TRANSIENT ELECTRIC FIELD DETECTION AND DISPLAY

OVERVIEW

Summary

The patent US 10,758,740 B2 introduces a system for detecting and displaying transient electric fields induced by Transcranial Magnetic Stimulation (TMS). The patent describes a method and system for the precise measurement and visualization of TMS effects, enhancing device calibration and therapy optimization. The market for TMS is expected to grow significantly, driven by technological advancements, regulatory endorsements, and a shift towards non-invasive treatments.

Market

The transcranial magnetic stimulation (TMS) system market is experiencing significant growth. As of 2022, the TMS market was valued at approximately USD 1.13 billion, with a compound annual growth rate (CAGR) of 9.0% from 2023 to 2030. This anticipated growth is a direct result of the increasing science supporting the use of TMS as a treatment for a spectrum of neurological and psychiatric disorders, including but not limited to Alzheimer's disease, Parkinson's disease, depression, and migraine.

The interest in TMS therapy is propelled by several factors. Technological advancements have led to the development of more precise, user-friendly, and effective TMS systems, enhancing their therapeutic potential. Regulatory endorsements by bodies such as the FDA have expanded the range of conditions treatable with TMS, further bolstering its market presence. Moreover, a shift in consumer behavior towards non-invasive and drug-free treatment modalities has heightened the demand for TMS therapy.

Technology

The patent US 10,758,740 B2 describes a system, apparatus, and method for the detection and display of transient electric fields, particularly those induced by Transcranial Magnetic Stimulation (TMS). This patent describes a novel approach to the measurement, visualization, and analysis of electric fields generated by TMS devices.

A key aspect of this invention is a magnetic field sensor equipped with a field detector designed to measure specific characteristics of TMS-induced electrical fields. The system includes a processor that processes these measurements to generate a human-readable depiction of the electrical field. This capability is important for the calibration and maintenance of TMS devices, ensuring their precision and effectiveness in clinical and research settings.

The patent describes a coil inductor probe, which is a key component of the field detector. This probe can detect changes in voltage across a coil, indicative of the presence and characteristics of an electric field generated by TMS. The processor, equipped with specialized software, converts these voltage changes into a visual representation of the electrical field, which can be displayed on a monitor. This real-time visualization provides can be used to study the effects of magnetic stimulation on the brain, facilitating adjustments to TMS protocols and enhancing the therapeutic outcomes.

One of the technical advantages of this system is its ability to provide precise and direct visualization of TMS effects. The system's design allows for extensive testing and calibration of TMS devices before their application in clinical trials or therapeutic settings, addressing a critical need for tools that can ensure the safety, precision, and efficacy of TMS treatments.

The primary applications of this technology are in the development, testing, calibration, and maintenance of TMS devices. By offering a detailed and accurate depiction of induced electrical fields, the system aids in the optimization of TMS therapies for various neurological and psychiatric disorders, including migraine, stroke, Parkinson's disease, dystonia, tinnitus, and depression.

REFERENCES

- Grand View Research, "Transcranial Magnetic Stimulation System Market Size, Share & Trends Analysis Report By Type (rTMS, dTMS), By Application (Depression, Epilepsy), By Age Group, By Region, And Segment Forecasts, 2023 - 2030," Grand View Research, 2023. [Online]. Available: [Online](#)

ADDITIONAL INFORMATION

- Potential Fields of Application:
 - Neurological and psychiatric disorder treatment
 - Clinical research on brain stimulation therapies
 - Development and calibration of medical devices
- Keywords:
 - Transcranial Magnetic Stimulation (TMS)
 - Electric field detection
 - Neurology
 - Psychiatric treatment
 - Medical device calibration
 - Brain stimulation
- Advantages:
 - Precise measurement and visualization of TMS-induced electrical fields.
 - Enhanced calibration and maintenance of TMS devices.
 - Improved safety and efficacy of TMS therapies.
 - Real-time feedback for optimizing treatment protocols.

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PATENT NUMBER

- US 10,758,740 B2

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Additional Information

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LICENSE STATUS

Available for License

CATEGORIES

- Devices
- Imaging devices

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ATTACHMENTS

-  [Download LH-2015-028 \(Hong\) Device and Methods for TMS Detection and Visualization.pdf](#)

EXTERNAL RESOURCES

- [Grand View Research, "Transcranial Magnetic Stimulation System Market Size, Share & Trends Analysis Report By Type \(rTMS, dTMS](#)

LH-2015-028