Deep field penetration in transcranial magnetic stimulation (TMS) via magnetic flux concentrator and strategic excitation coil placement

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Technology description

Description

Transcranial Magnetic Stimulation (TMS) is a non-invasive method for non-contact stimulation of neurons in the brain by magnetic induction of electrical currents. Conventional TMS devices are capable of only achieving 1.5 – 3cm penetration from the scalp, and such devices are very uncomfortable for patients as their use is associated with painful muscular contractions. This invention relates to a novel brain stimulation method/system for achieving a deep penetration of TMS induced electric field using a magnetic field focusing lens in combination with a strategic placement of multiple excitation coils.

Value Proposition

The system/process:

•Effectively alters the neuronal activity in the area of stimulation

•Avoids dependency on the individual’ s cooperation with minimal or no discomfort

•Avoids over-excitation of patient scalps, as observed with conventional systems/techniques

•Helps in achieving a deep penetration depth (~7 cm) to any section of brain as compared to 1.5-3.0cm penetration observed with prior art techniques

•Would be commercially useful for the following applications:

oTreatment of chronic depression

oTreatment of autism, Parkinson Disease, traumatic brain injury, and other neurological disorders

oResearch in the neurological and mental health fields

oDiagnosis and treatment of a wide range of psychiatric disorders and neurological injuries

oNon-invasive treatment of seizure, mesial temporal sclerosis (MTS), hippocampal sclerosis, temporal lobe epilepsy (TLE), memory disorders, and amnesia

Application area

Provisional Application 61/970,860

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