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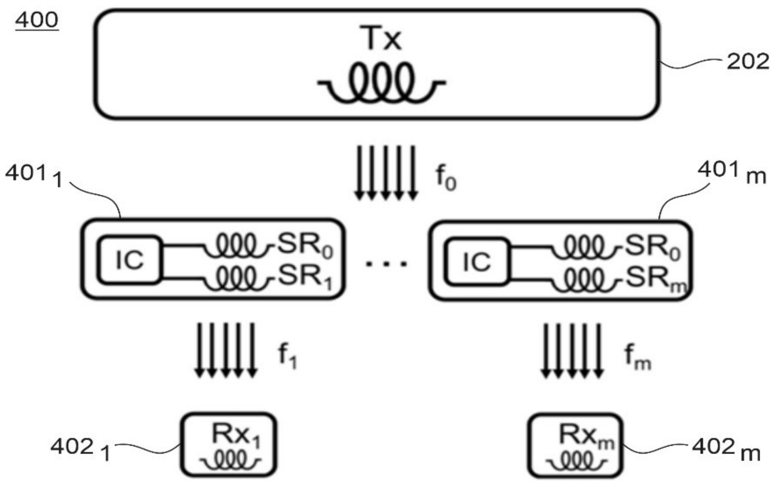
Licensing Opportunity

TTO – Technology Transfer Office

Multiple frequency inductive link to wirelessly power miniaturized implants



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Keywords

Coils, brain implants, inductive link, wireless powering

Intellectual Property

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Description

Wireless power transfer for neural implants traditionally involves an external transmitter coil (Tx) and an implanted receiver coil (Rx), operating at a resonating frequency f0f_0f0. While effective for larger devices, the efficiency dramatically decreases for sub-millimeter implants due to weak magnetic coupling. Recent advancements incorporate intermediate resonator coils to amplify the magnetic field locally, increasing energy transfer efficiency. However, challenges such as electromagnetic interference (EMI) and tissue absorption at higher frequencies remain critical, particularly for GHz-range operations in smaller implants.

Advantages

This modular, multi-frequency system increases the efficiency of power transfer to smaller neural implants by using intermediate resonator coils, which focus and amplify the magnetic field. The active integrated circuits adjust the frequency between resonator coils, improving energy conversion and reducing power loss. The design allows for simultaneous power supply to multiple implants, expanding its application. Additionally, it meets safety standards like SAR limits, ensuring regulatory compliance, and minimizing electromagnetic interference, especially important for smaller implants operating at high frequencies.

Applications

- Neural implants for neurostimulation and brain-machine interfaces.
- Advanced prosthetics and sensory devices.
- Medical diagnostics and monitoring devices implanted in the body.