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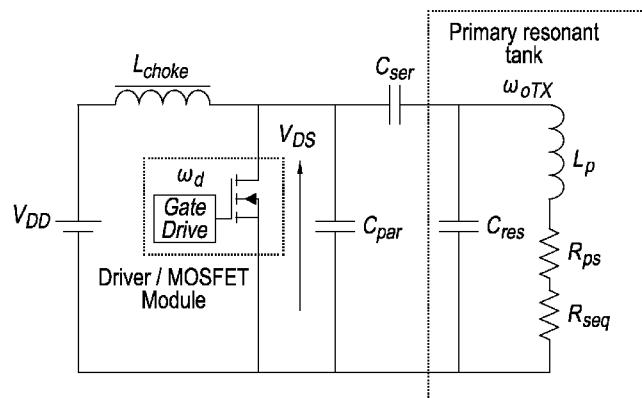
(54) **Title:** INDUCTIVE POWER TRANSFER SYSTEM

Fig. 8

(57) **Abstract:** An inductive power transfer system comprises a transmitter coil TX and a receiver coil RX spaced from the transmitter coil. A transmitter circuit comprises the transmitter coil and is in the form of a Class E amplifier with a first inductor U_{choke} and a transistor in series between the terminals of a power supply, a first transmitter capacitor C_{par} in parallel with the transistor between the first inductor and a power supply terminal, a primary tank circuit in parallel with the first transmitter capacitor, the primary tank circuit comprising the transmitter coil and a second transmitter capacitor C_{res} arranged in parallel with the transmitter coil, and a third transmitter capacitor C_{ser} in series with the first inductor between the first transmitter capacitor and the primary tank circuit. The transistor is arranged to switch at a first frequency ω_d and the capacitance of the second transmitter capacitor is selected such that the resonant frequency ω_{oTX} of the primary tank circuit is greater than the first frequency. The receiver circuit comprises a Class E rectifier having a first receiver capacitor C_L arranged in parallel with a load R_L and a secondary tank circuit in parallel with the first receiver capacitor. The secondary tank circuit comprises the receiver coil and a second receiver capacitor C_{res} arranged in parallel or series with the receiver coil. A first diode D_{r2} is provided between the secondary tank circuit and the first receiver capacitor. The capacitance of the second receiver capacitor is selected such that the resonant frequency ω_{oRX} of the secondary

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tank circuit differs from the first frequency, so that the secondary tank circuit operates in semi-resonance and maintains some reactive impedance. The transmitter circuit is configured to vary the first frequency, in order to achieve a desired impedance of the primary tank circuit.