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Ye et al.

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(54) **WIRELESS POWER TRANSMITTERS WITH WIDE INPUT VOLTAGE RANGE AND METHODS OF THEIR OPERATION**

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H02J 7/02 (2016.01)

(52) **U.S. Cl.**
CPC **H02J 7/025** (2013.01)

(58) **Field of Classification Search**
USPC 320/108, 162
See application file for complete search history.

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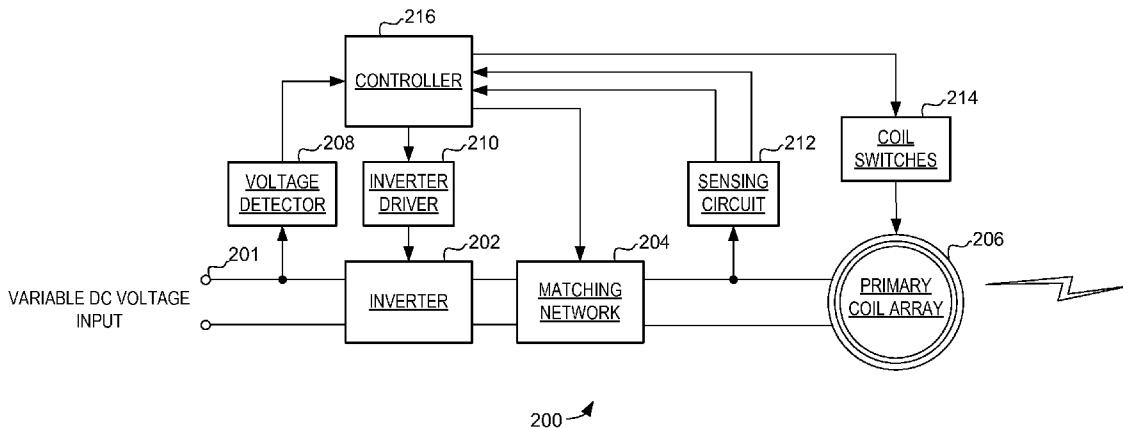
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Primary Examiner — Brian Ngo

(57) **ABSTRACT**

The embodiments described herein provide a power transmitter for wireless charging of an electronic device and methods of its operation. The power transmitter uses an inverter configured to generate a square wave from a potentially wide ranging DC input voltage. The inverter is configured to generate the square wave with a duty cycle that results in a desired equivalent voltage output, effectively independent of the DC input voltage that is provided. Thus, by generating a square wave with a selectable duty cycle the inverter provides the ability to facilitate wireless power transfer with a wide range of DC input voltages. Furthermore, in some embodiments the power transmitter may provide improved power transfer efficiency using a quasi-resonant phase shift control strategy with adjustable dead time and a matching network that is dynamically selectable to more effectively couple with the transmitter coil combination being used to transmit power to the electronic device.

20 Claims, 6 Drawing Sheets



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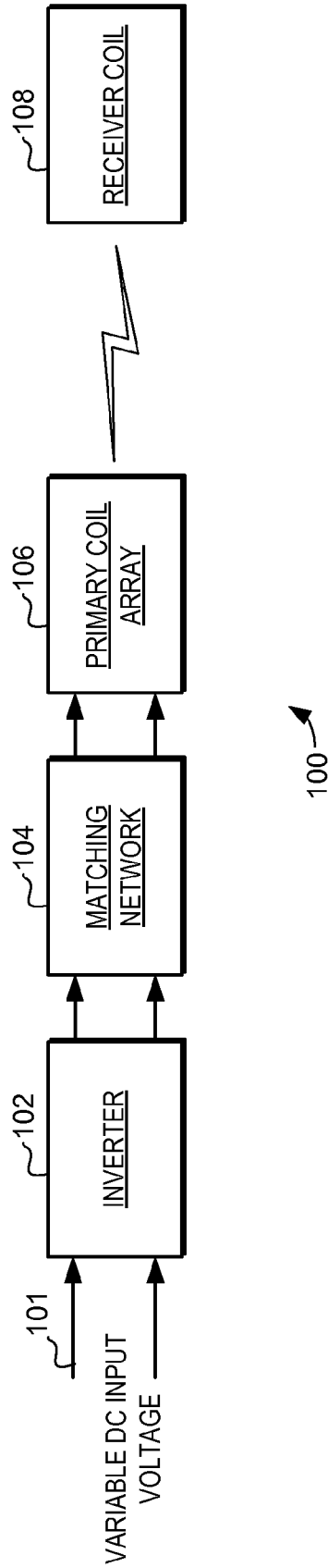


FIG. 1

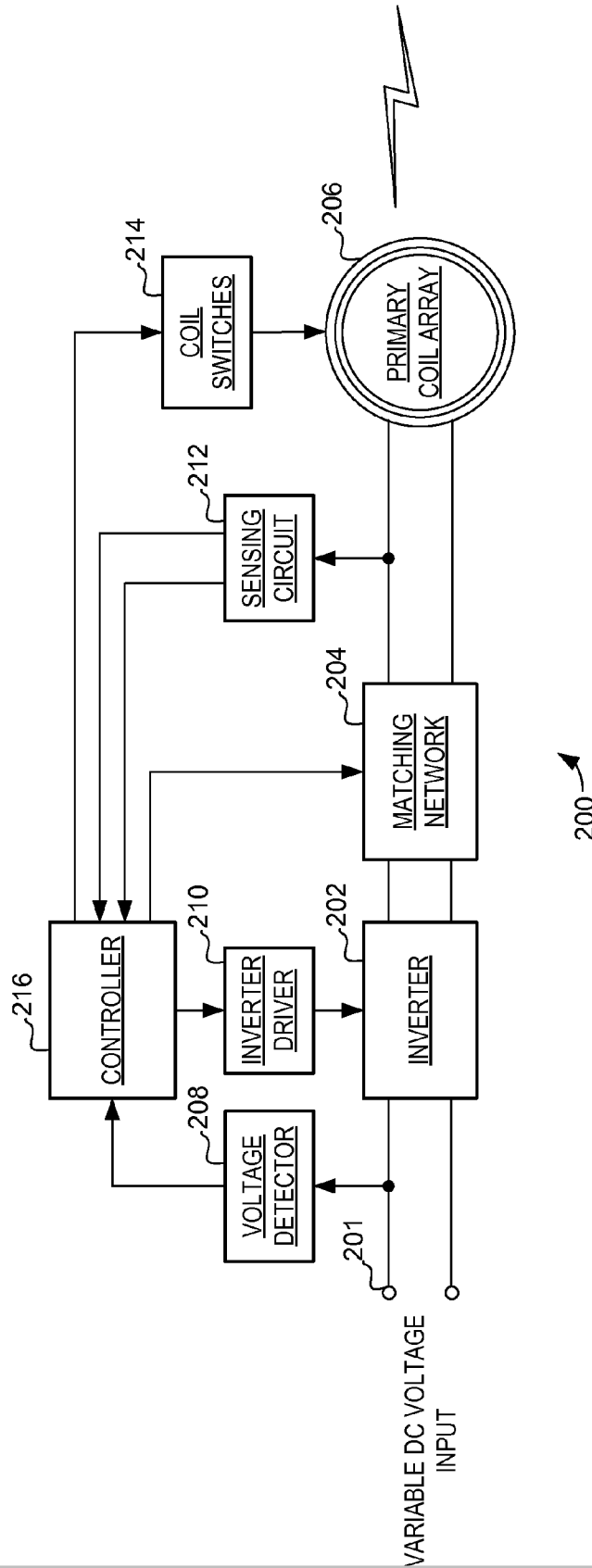


FIG. 2

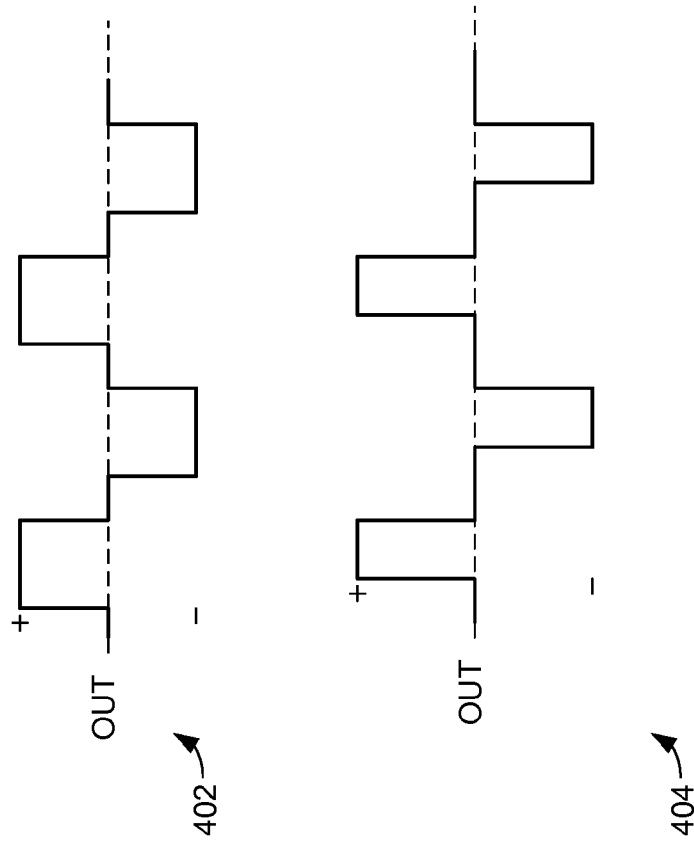


FIG. 4

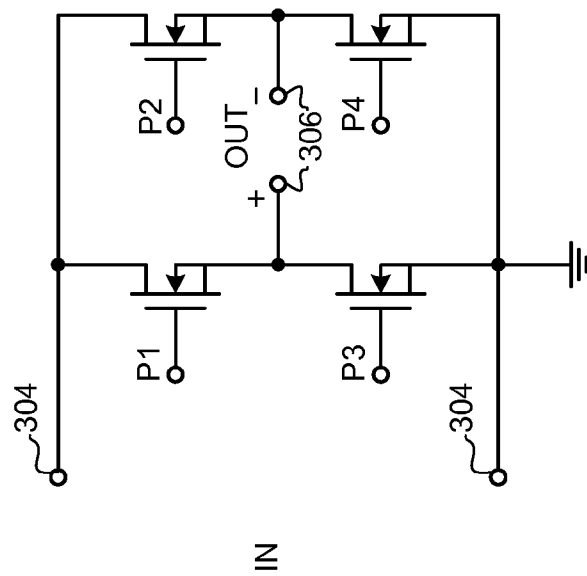


FIG. 3

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