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Mathe et al.

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(54) **LOW-VOLTAGE POWER-EFFICIENT ENVELOPE TRACKER**

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H03F 3/217 (2006.01)

(52) **U.S. Cl.**
USPC **330/251**; 330/136; 330/297

(58) **Field of Classification Search**
USPC ..... 330/10, 136, 207 A, 251, 297
See application file for complete search history.

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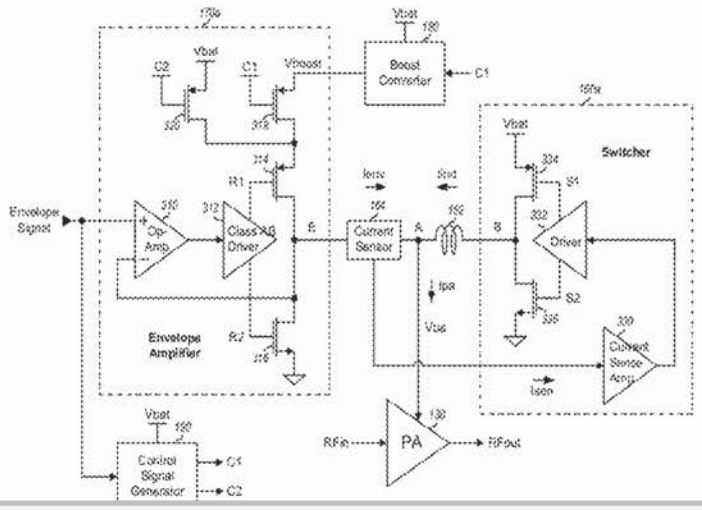
(57) **ABSTRACT**

Techniques for efficiently generating a power supply are described. In one design, an apparatus includes an envelope amplifier and a boost converter. The boost converter generates a boosted supply voltage having a higher voltage than a first supply voltage (e.g., a battery voltage). The envelope amplifier generates a second supply voltage based on an envelope signal and the boosted supply voltage (and also possibly the first supply voltage). A power amplifier operates based on the second supply voltage. In another design, an apparatus includes a switcher, an envelope amplifier, and a power amplifier. The switcher receives a first supply voltage and provides a first supply current. The envelope amplifier provides a second supply current based on an envelope signal. The power amplifier receives a total supply current including the first and second supply currents. In one design, the switcher detects the second supply current and adds an offset to generate a larger first supply current than without the offset.

20 Claims, 6 Drawing Sheets



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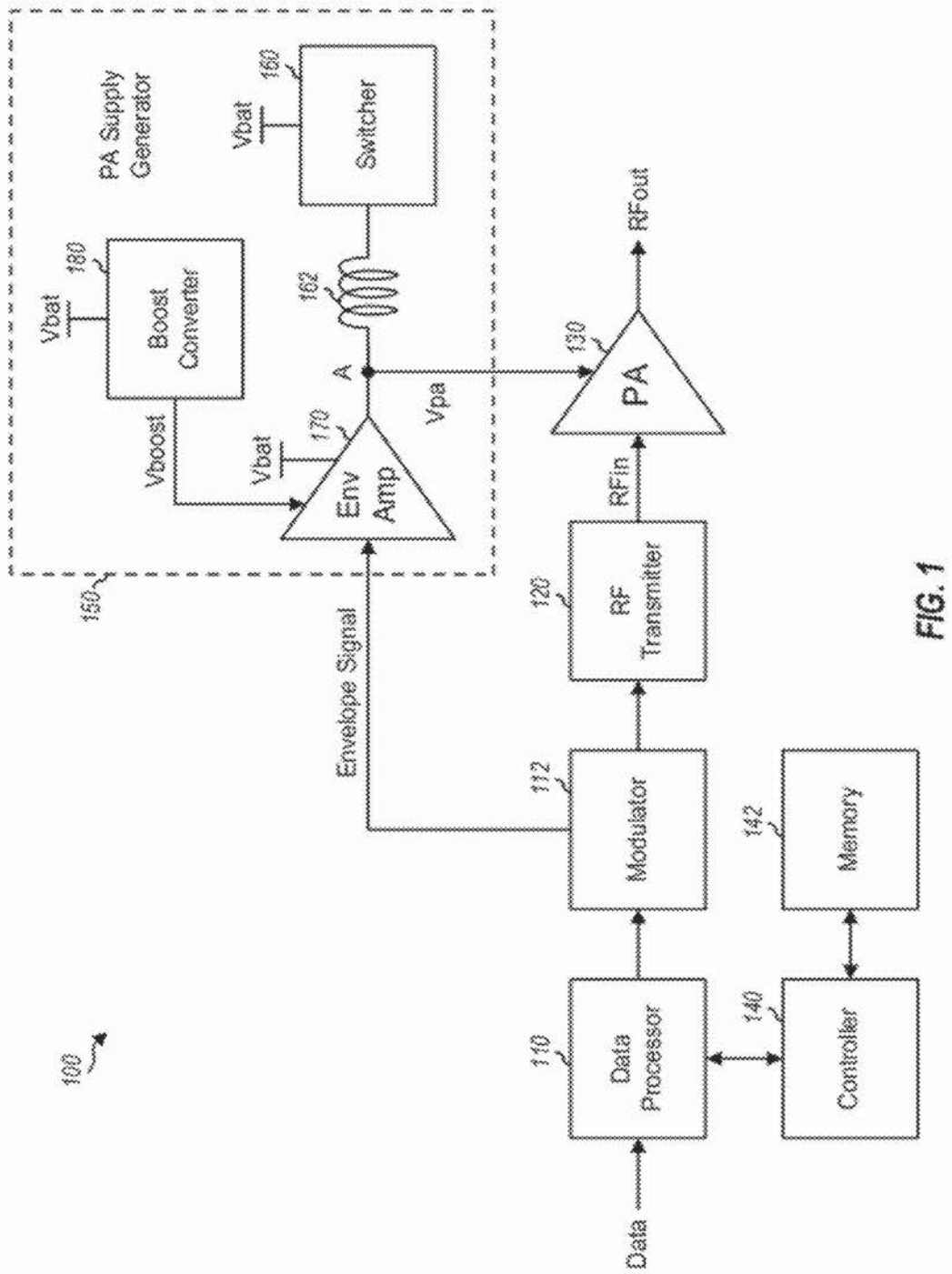
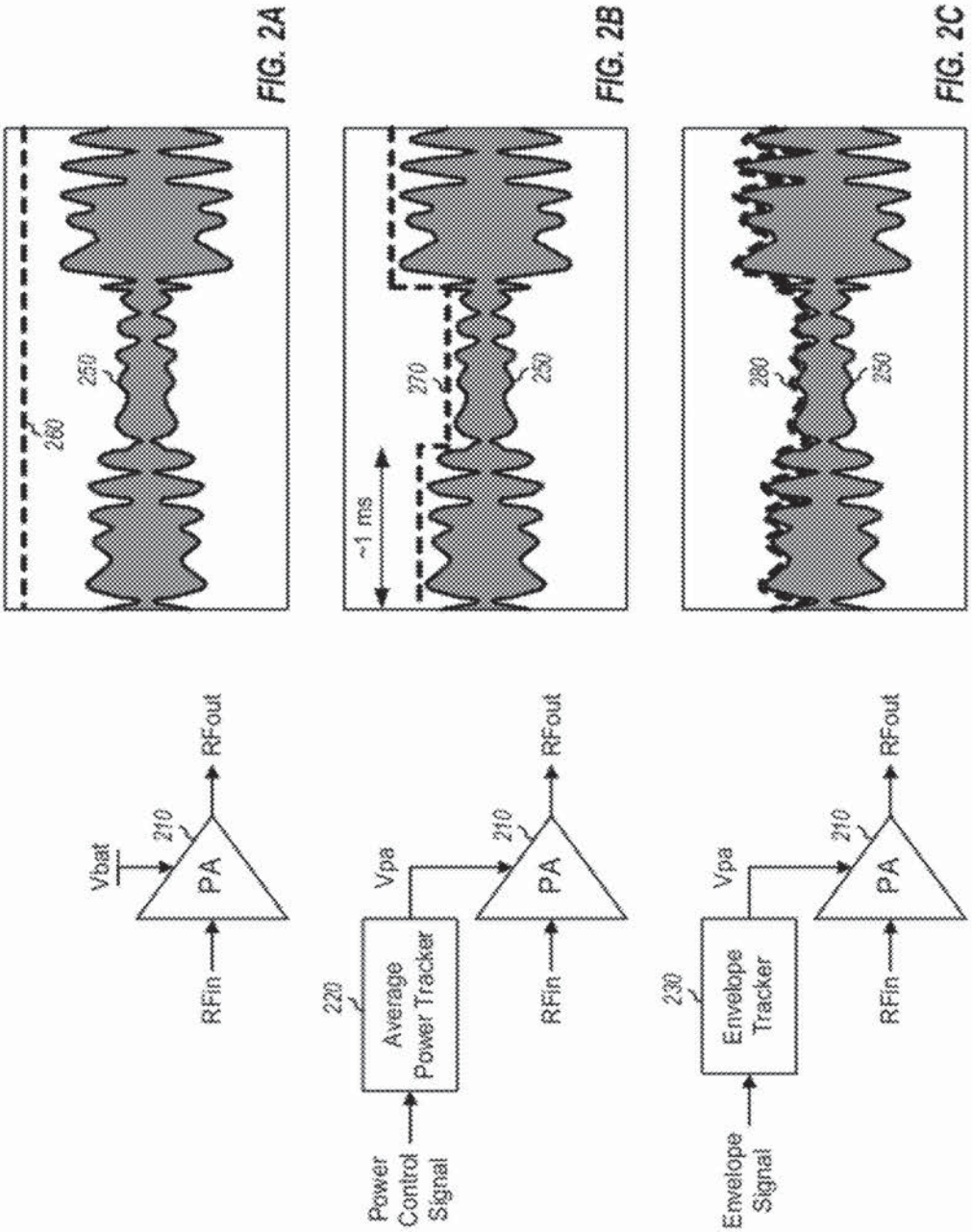


FIG. 1



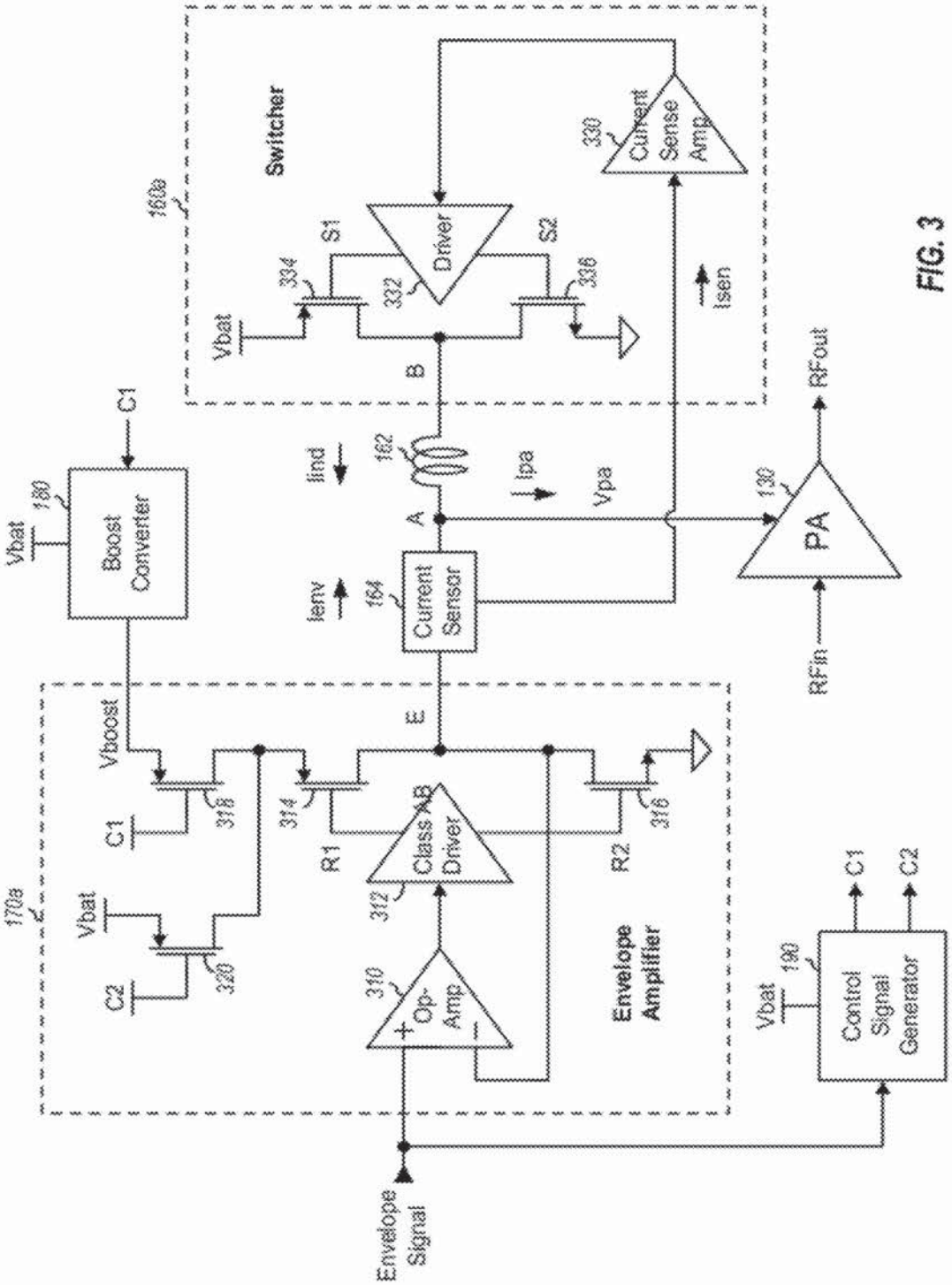


FIG. 3

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