

We claim:

1. An apparatus comprising:
 - output driver circuitry having a predefined termination impedance; and
 - an output driver replica of the output driver circuitry having independently controlled first and second portions, the first and second portions being independently controlled by a first feedback loop and a second feedback loop, respectively, to establish a substantially equal on-resistance of the first and the second portions, in which an output of the first portion is directly fed back into an input of the first portion, and an output of the second portion is directly fed back into an input of the second portion, the output driver replica controlling the predefined termination impedance of the output driver circuitry.
2. The apparatus as claimed in claim 1, comprising a first controller configured to independently control the first portion with the first feedback loop and a second controller configured to independently control the second portion with the second feedback loop.
3. The apparatus as claimed in claim 2, in which the first and the second controllers are configured to establish substantially equal on-resistance at the first and the second portions by setting the voltage at a node between the first and second portions to half of a predefined reference voltage.
4. The apparatus as claimed in claim 2, in which the first and the second controllers comprise operational transmittance amplifiers.
5. The apparatus as claimed in claim 1, in which the first and the second portions of the output driver replica are implemented within a single circuit.
6. The apparatus as claimed in claim 1, in which the first and the second portions of the output driver replica are implemented such that transistors of the first and the second portions are positioned within the same circuit to correspond with the positions of transistors in the output driver circuitry.
7. The apparatus as claimed in claim 1, in which a plurality of transistors are implemented in parallel at the output driver circuitry to match a corresponding impedance of at least one transistor at the output driver replica.
8. The apparatus as claimed in claim 1, comprising a pre-driver controlled by the output driver replica, the pre-driver being configured to control an output impedance of the output driver circuitry.
9. The apparatus as claimed in claim 1, integrated into a mobile phone, a set top box, a music player, a video player, an entertainment unit, a navigation device, a computer, a hand-held personal communication systems (PCS) unit, a portable data unit, and/or a fixed location data

unit.

10. A method comprising:

controlling a first portion of an output driver replica of a voltage mode driver by a first feedback loop; and

independently controlling a second portion of the output driver replica to establish a substantially equal on-resistance of the first and the second portions, thereby creating a balanced single-ended output resistance of the voltage mode driver, the second portion controlled by a second feedback loop in which an output of the first portion is directly fed back into an input of the first portion, and an output of the second portion is directly fed back into an input of the second portion.

11. The method as claimed in claim 10, in which independently controlling the second portion comprises setting a voltage at a node between the first and the second portions to half of a predefined reference voltage.

12. The method as claimed in claim 10, comprising, controlling a pre-driver with the output driver replica to control an output impedance of the output driver circuitry.

13. The method as claimed in claim 10, comprising applying an output of the voltage mode driver in a mobile phone, a set top box, a music player, a video player, an entertainment unit, a navigation device, a computer, a hand-held personal communication systems (PCS) unit, a portable data unit, and/or a fixed location data unit.

14. A method comprising the steps of:

controlling a first portion of an output driver replica of a voltage mode driver by a first feedback loop; and

independently controlling a second portion of the output driver replica to establish a substantially equal on-resistance of the first and the second portions, thereby creating a balanced single-ended output resistance of the voltage mode driver, the second portion controlled by a second feedback loop in which an output of the first portion is directly fed back into an input of the first portion, and an output of the second portion is directly fed back into an input of the second portion.

15. The method as claimed in claim 14, comprising the step of applying an output of the voltage mode driver in a mobile phone, a set top box, a music player, a video player, an entertainment unit, a navigation device, a computer, a hand-held personal communication systems (PCS) unit, a portable data unit, and/or a fixed location data unit.

16. An apparatus comprising:

means for driving an output of a voltage mode driver having a predefined termination impedance; and

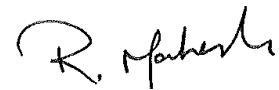
means for replicating the output driving means by independently controlling first and second portions of the replicating means, to establish a substantially equal on-resistance of the first and the second portions, the replicating means controlling the predefined termination impedance of the output driving means, the first and second portions controlled by a first feedback loop and a second feedback loop, respectively in which an output of the first portion is directly fed back into an input of the first portion, and an output of the second portion is directly fed back into an input of the second portion.

17. The apparatus as claimed in claim 16, comprising means for establishing substantially equal on-resistance at the first and the second portions by setting the voltage at a node between the first and second portions to half of a predefined reference voltage.

18. The apparatus as claimed in claim 16, comprising means for controlling an output impedance of the output driving means, the controlling means being controlled by the replicating means.

19. The apparatus as claimed in claim 16, integrated into a mobile phone, a set top box, a music player, a video player, an entertainment unit, a navigation device, a computer, a hand-held personal communication systems (PCS) unit, a portable data unit, and/or a fixed location data unit.

Dated this 11th day of July, 2014



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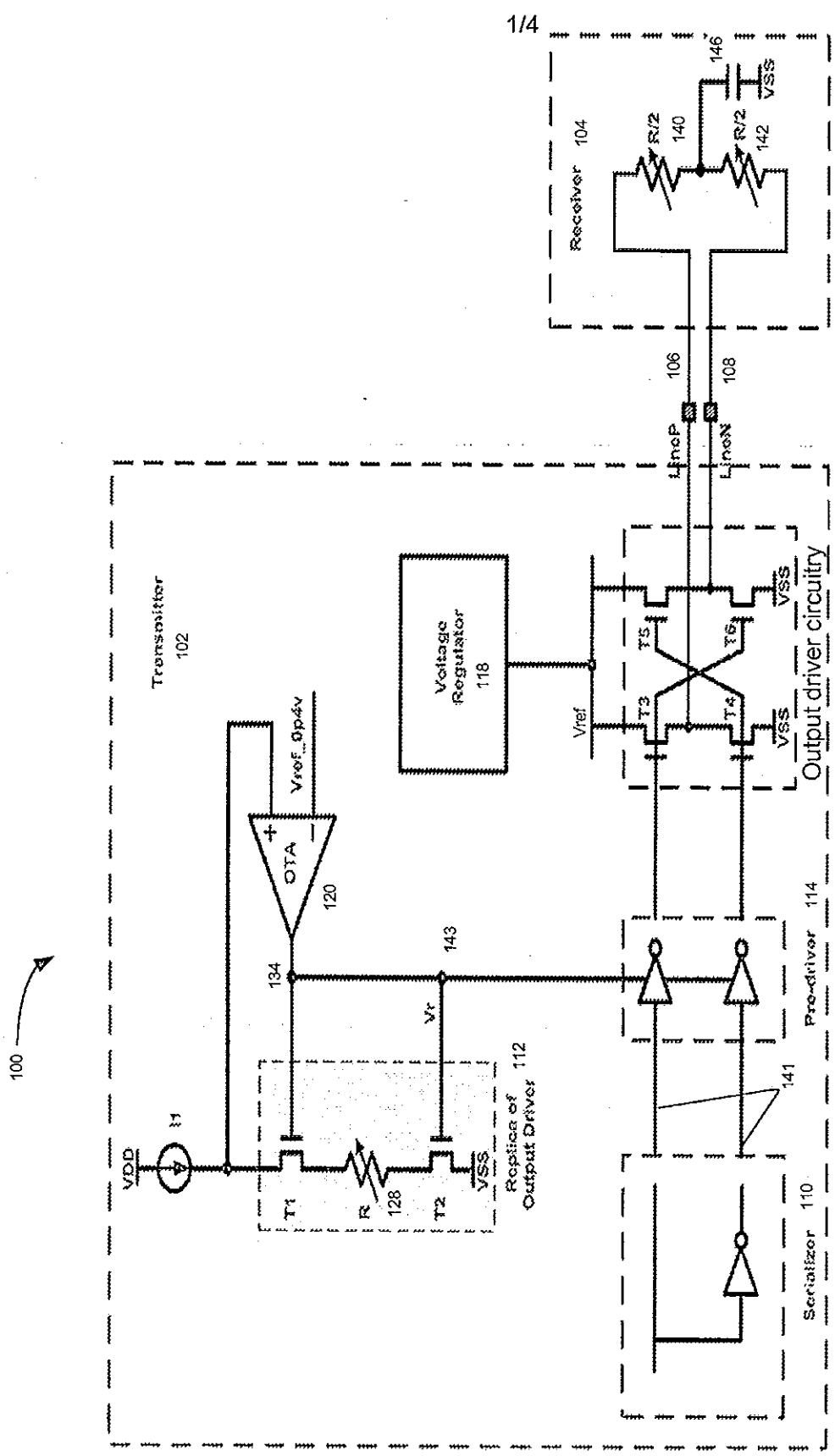


FIG. 1 (PRIOR ART)

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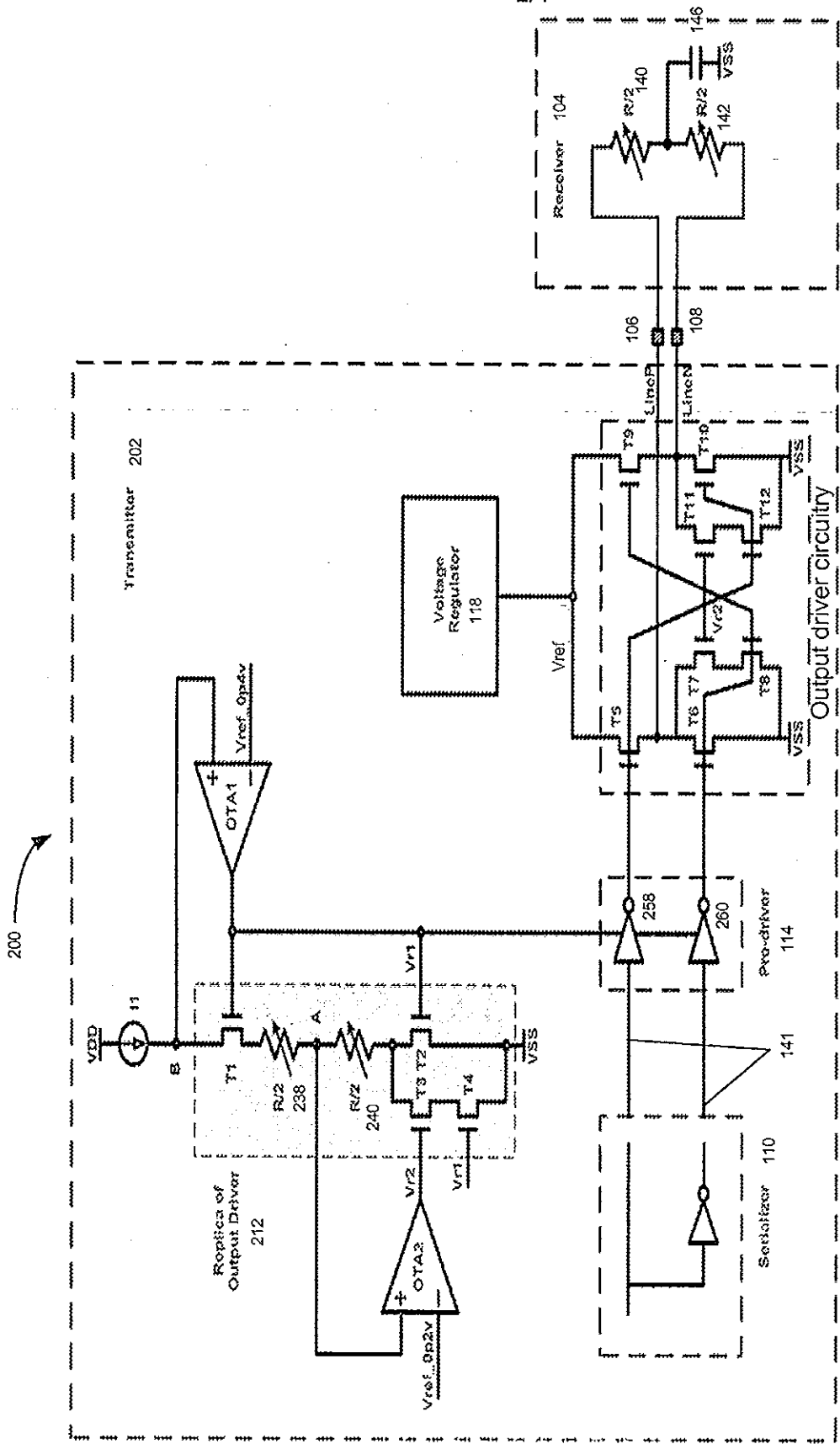


FIG. 2

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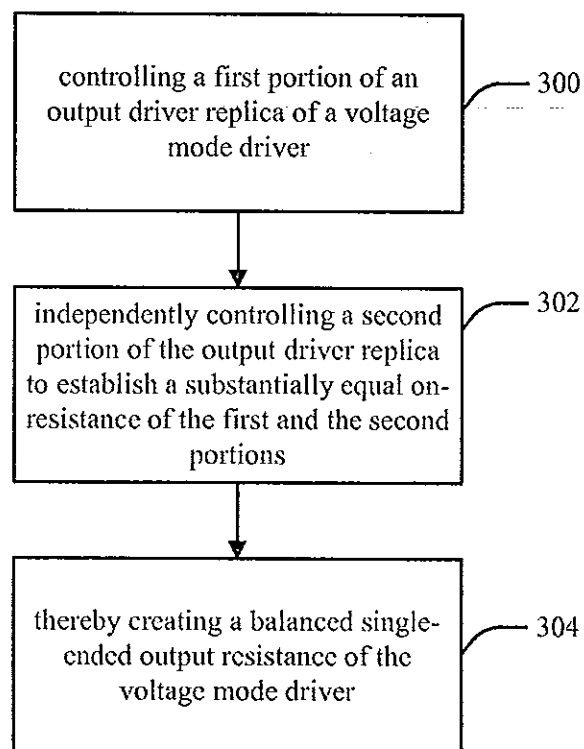


FIG. 3

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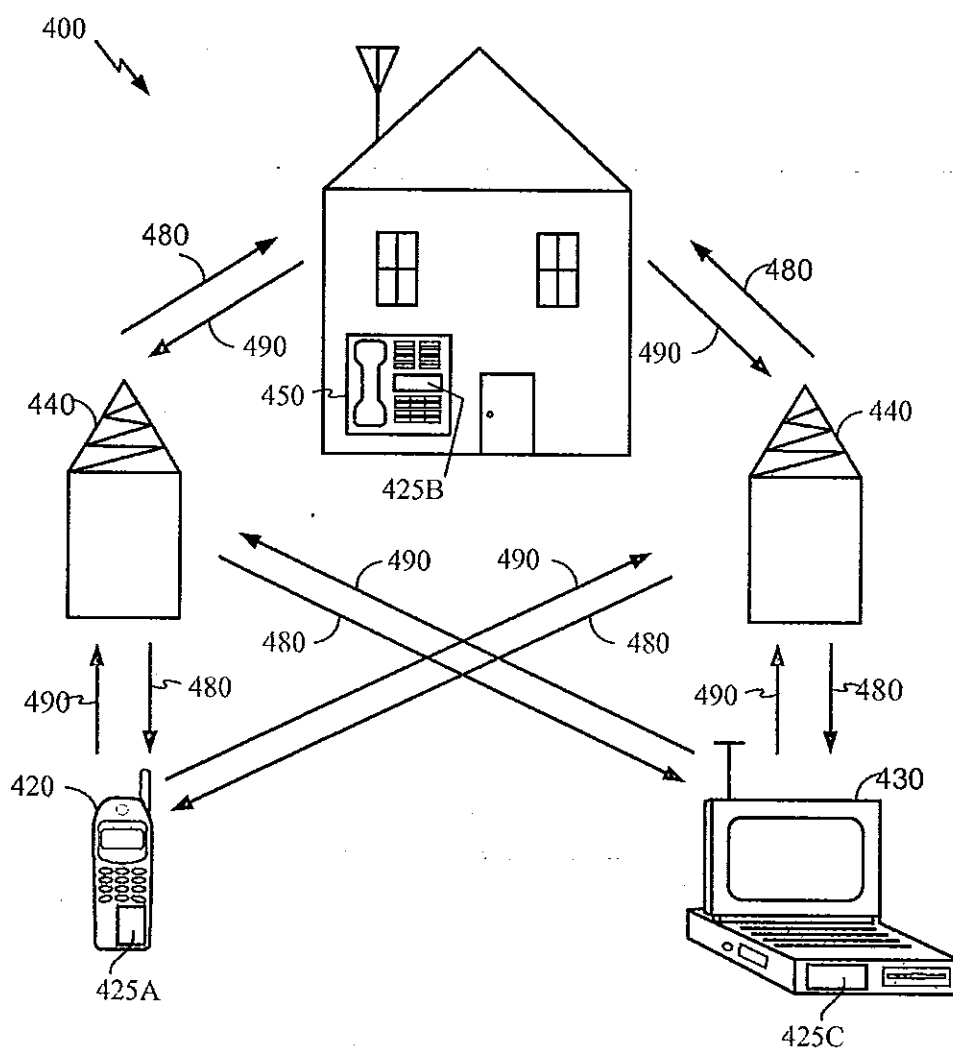


FIG. 4