We Claim:

1. A block power switch to provide an internal voltage to a circuit block, the block power switch comprising:

a power switch, operable to turn on in response to an enable signal, the enable signal independent of an electrostatic discharge (ESD) event and independent of an external power supply rail voltage;

ESD protection circuitry to open the power switch in response to the ESD event; and

an ESD diode to couple the internal voltage to the external power supply rail voltage.

2. The block power switch as claimed in claim 1, the power switch comprising at least one transistor.

3. The block power switch as claimed in claim 2, further comprising adaptive body biasing circuitry coupled to the at least one transistor.

4. The block power switch as claimed in claim 1 in which the power switch comprises head switch circuitry.

5. The block power switch as claimed in claim 1 in which the power switch comprises foot switch circuitry.

6. The block power switch as claimed in claim 1, integrated into at least one of 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 a fixed location data unit.

7. An apparatus comprising:

a power switch, operable to turn on in response to an enable signal, the enable signal independent of an electrostatic discharge (ESD) event and independent of an external power supply rail voltage;

a means for ESD protection, the means for ESD protection to open the power switch in response to the ESD event; and

an ESD diode to couple an internal voltage to the external power supply rail voltage.

8. The apparatus as claimed in claim 7, the power switch comprising at least one transistor.

9. The apparatus as claimed in claim 8, further comprising adaptive body biasing means coupled to the at least one transistor.

10. The apparatus as claimed in claim 7 in which the power switch comprises head switch means.

11. The apparatus as claimed in claim 7 in which the power switch comprises foot switch means.

12. The apparatus as claimed in claim 7, further comprising means for integrating the apparatus into at least one of 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 a fixed location data unit.

13. An apparatus comprising:

a logic circuit configured to produce an output signal; and

a first switch configured to be connected between a power supply and power supply input of a circuit to be protected and configured to receive, at a control terminal, the output signal, wherein the first switch is configured to be closed in response to the logic circuit receiving a first enable signal without concurrently receiving an electrostatic discharge; and

wherein the logic circuit has a first input configured to receive the first enable signal and a second input configured to receive the electrostatic discharge; and

a resistor connected to the second input and configured to be connected to the power supply; and

a capacitor connected to the second input and configured to be connected to the power supply input of the circuit to be protected.

14. The apparatus as claimed in claim 13, wherein a voltage of the power supply is greater than a ground voltage and further comprising a diode having a cathode configured to be connected to the power supply and an anode configured to be connected to the power supply input of the circuit to be protected.

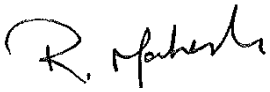
15. The apparatus as claimed in claim 13, wherein a voltage of the power supply is equal to a ground voltage and further comprising a diode having an anode configured to be connected to the power supply and a cathode configured to be connected to the power supply input of the circuit to be protected.

16. The apparatus as claimed in claim 13, further comprising a second switch configured to be connected between the power supply and the power supply input of the circuit to be protected and configured to receive, at a control terminal of the second switch, the first enable signal.

17. The apparatus as claimed in claim 13, further comprising a second switch configured to be connected between the power supply and the power supply input of the circuit to be protected and configured to receive, at a control terminal of the second switch, a second enable signal.

18. The apparatus as claimed in claim 13, wherein the logic circuit comprises: a NAND gate having a first input configured to receive the first enable signal, a second input configured to receive the electrostatic discharge, and an output configured to produce an intermediate signal; and an inverter configured to receive the intermediate signal and to produce the output signal.

Dated this 01.04.2014



[R. MAHESH]
OF REMFRY & SAGAR
ATTORNEY FOR THE APPLICANT(S)

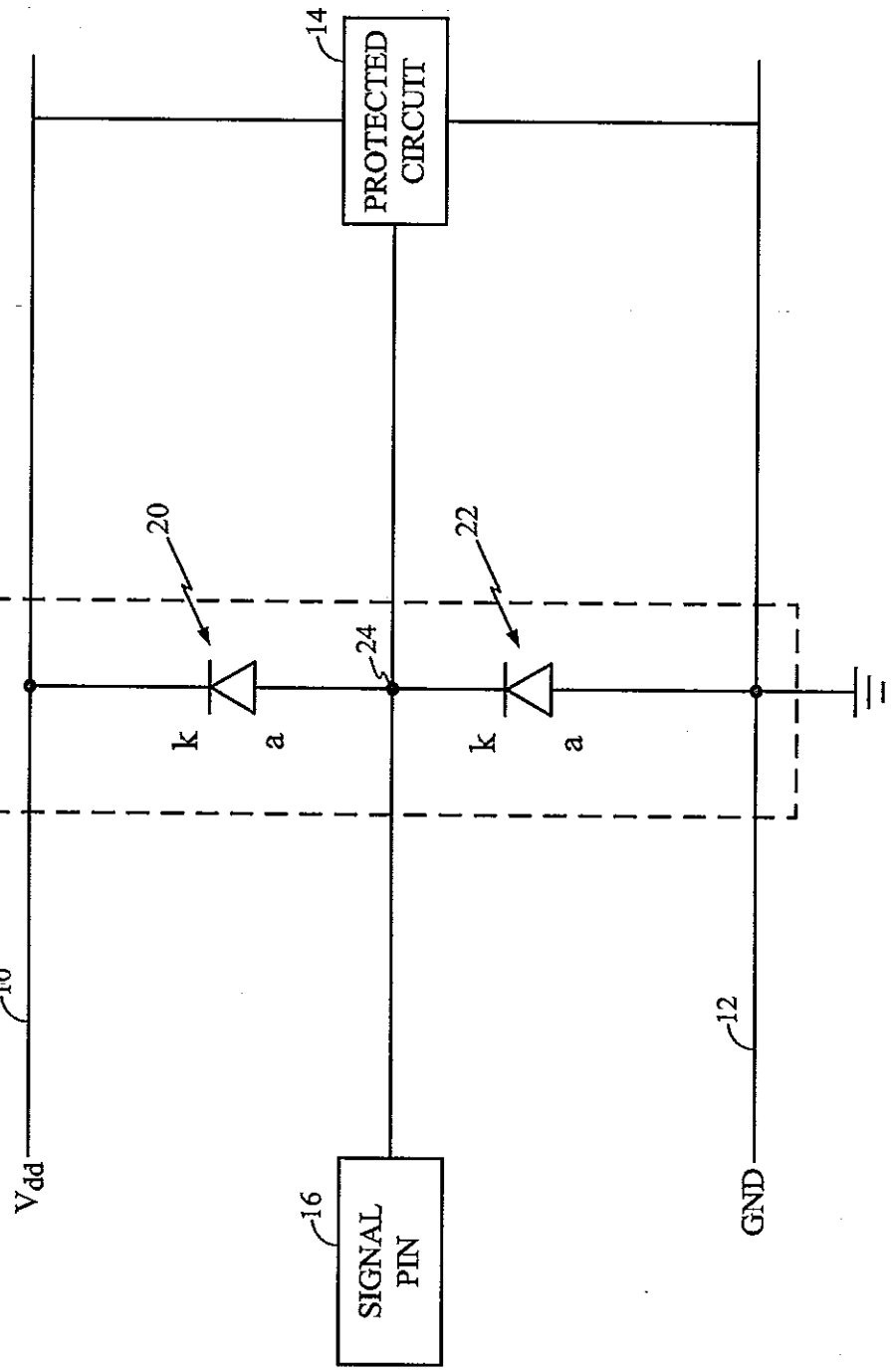


FIG. 1
(PRIOR ART)

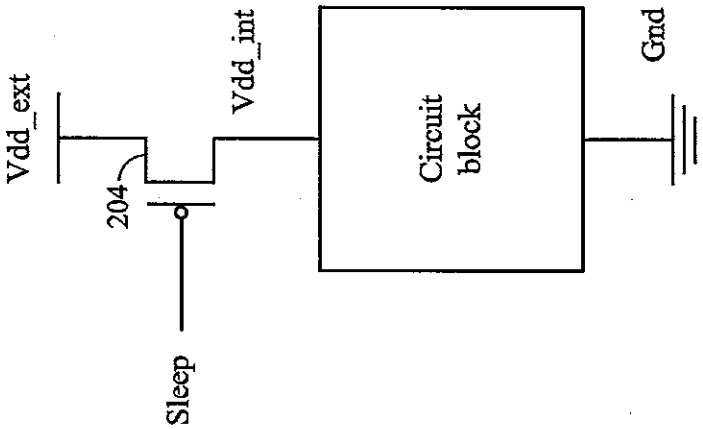

Vdd_ext
204
Vdd_int
Circuit block
Gnd
Sleep

FIG. 2B

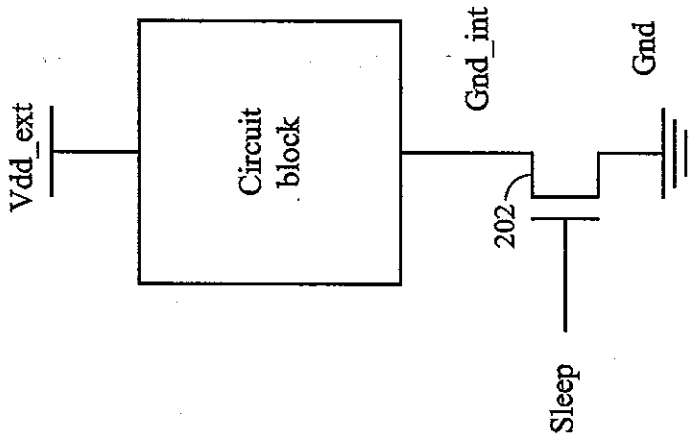

Vdd_ext
Circuit block
Gnd_int
Gnd
202
Sleep

FIG. 2A

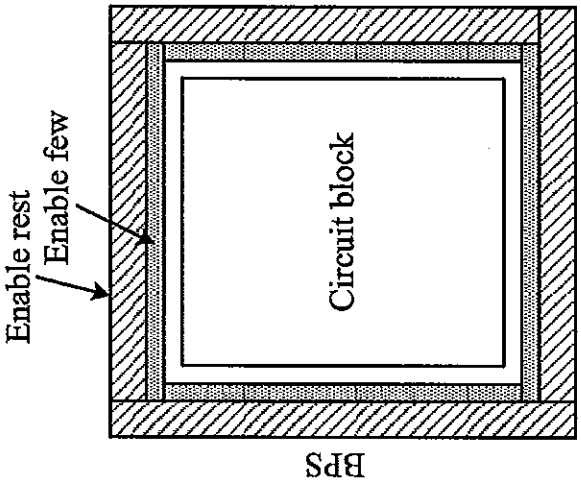


FIG. 3C

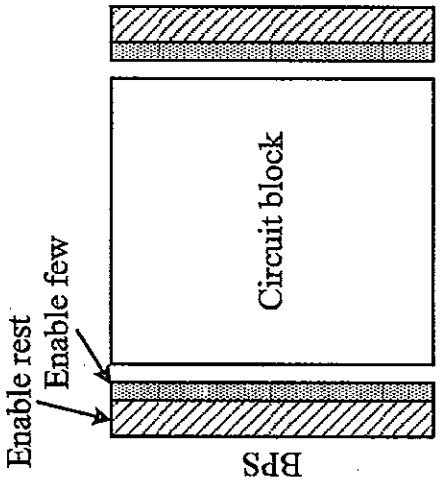


FIG. 3B

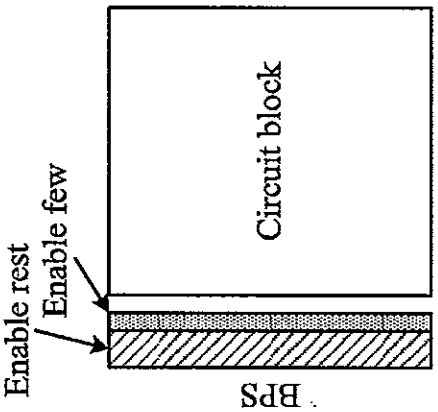


FIG. 3A

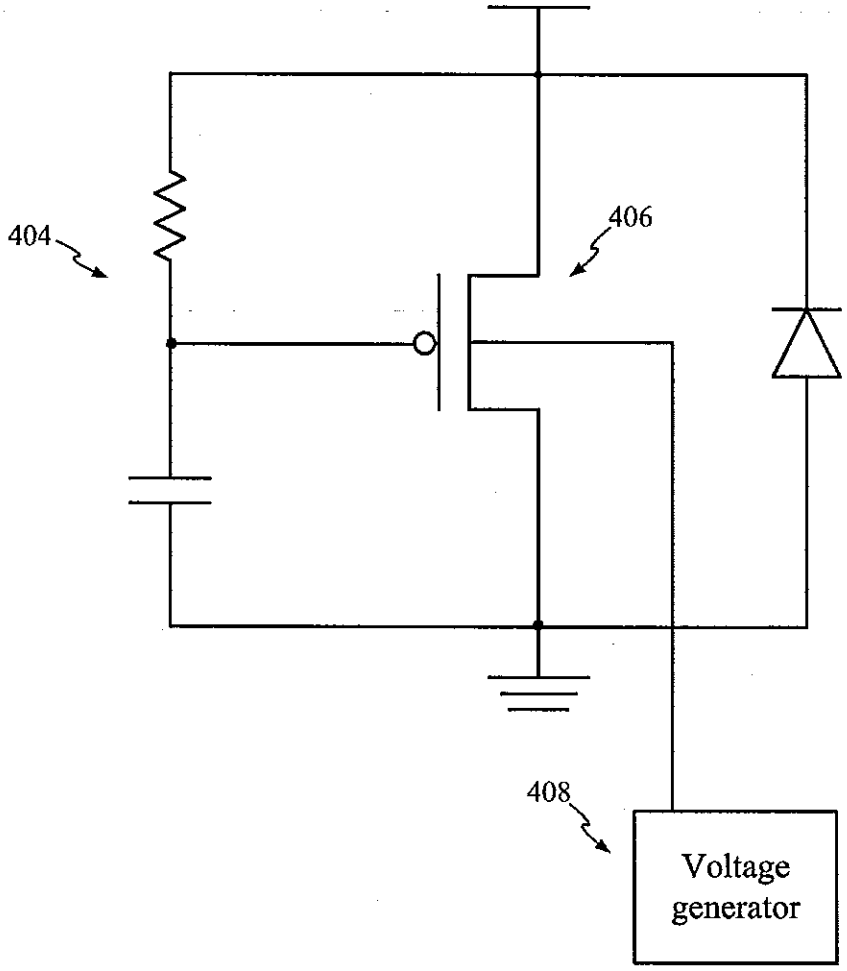


FIG. 4

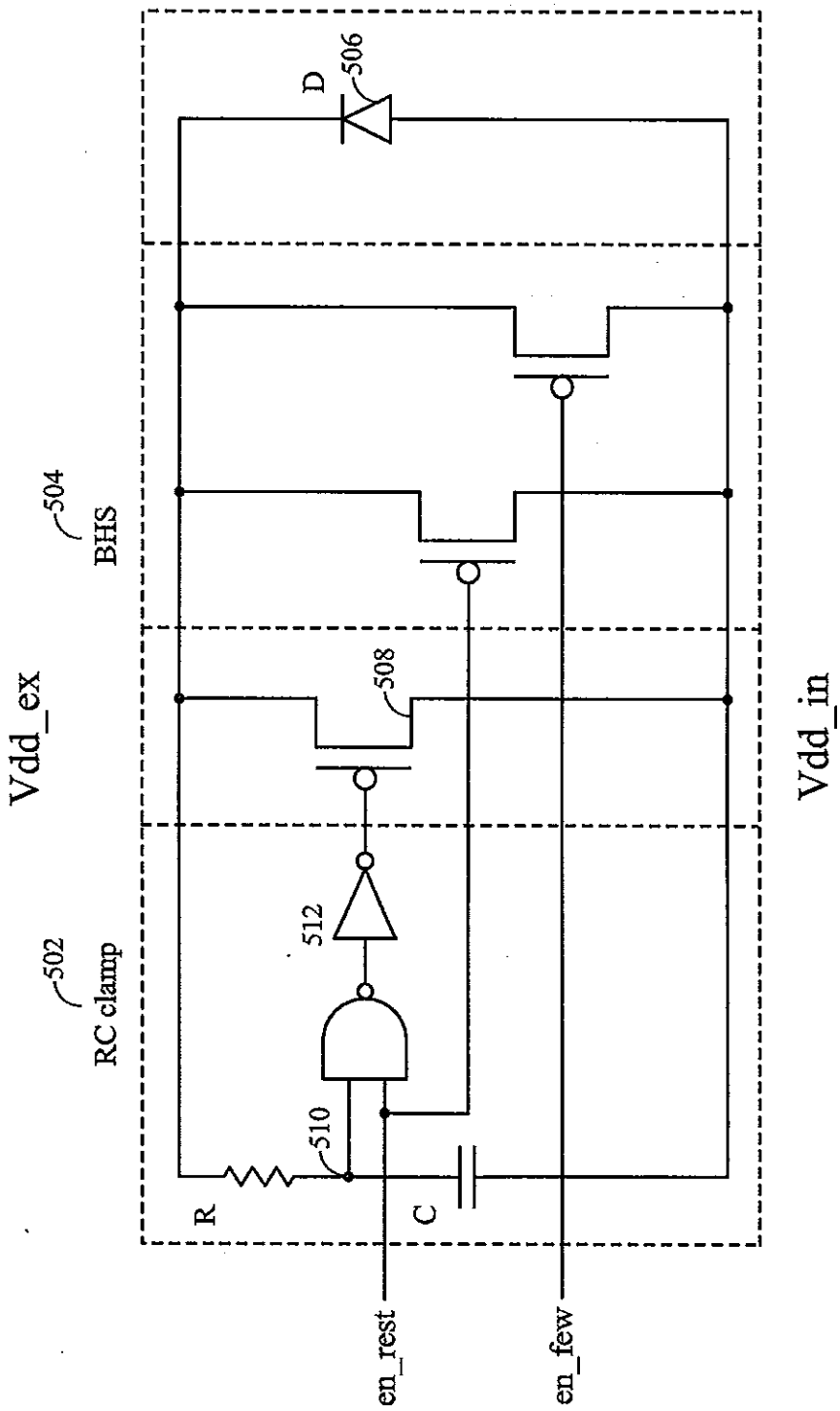

Vdd_ex
Vdd_in
504
BHS
502
RC clamp
D
506
508
512
510
R
C
en_rest
en_few

FIG. 5

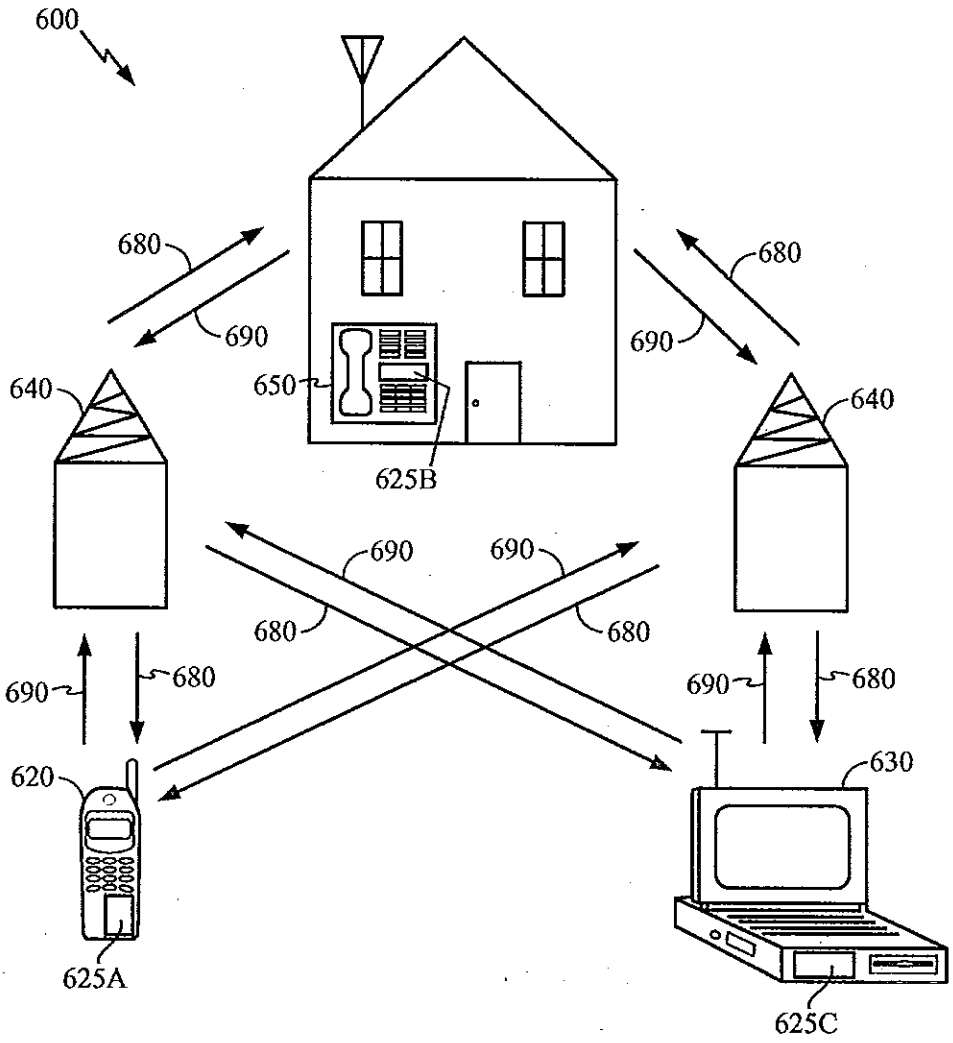

600
680
690
650
625B
640
640
690
690
680
680
690
680
690
680
620
625A
630
625C

FIG. 6

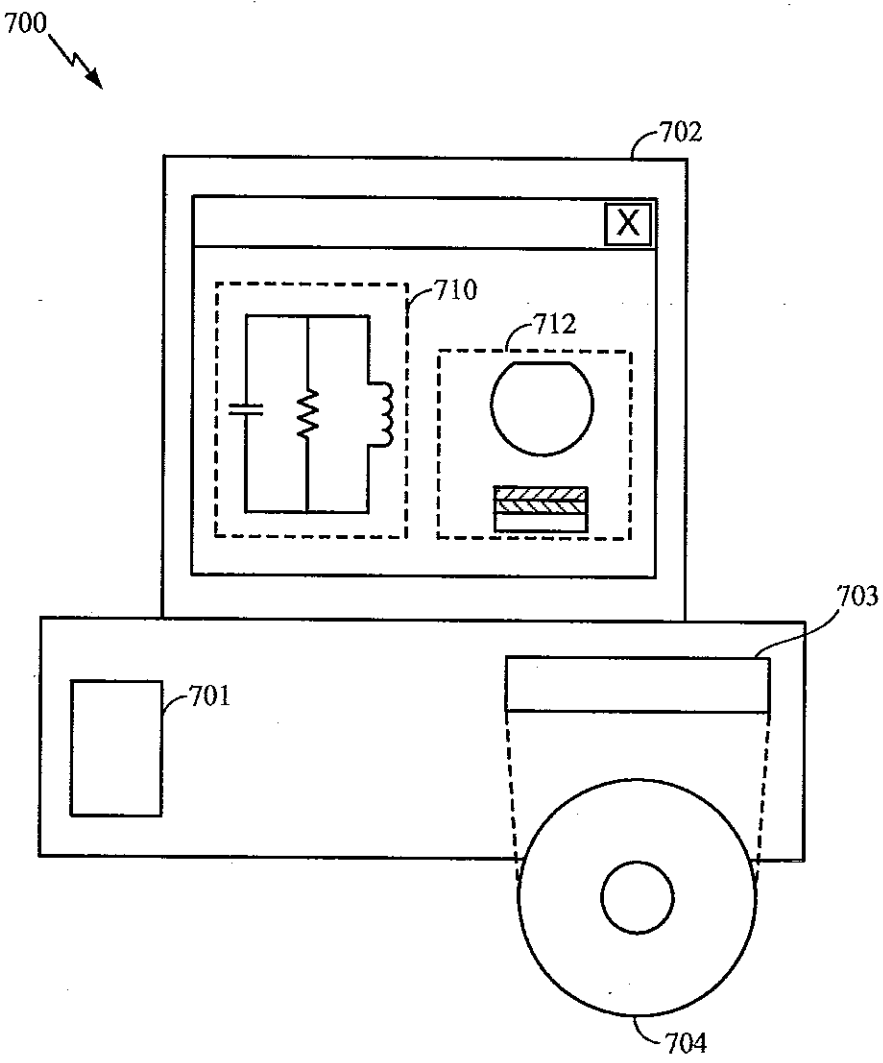


FIG. 7

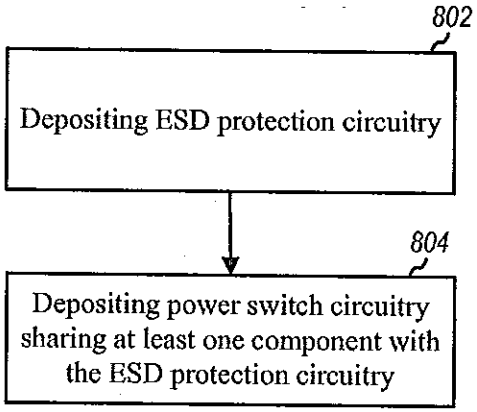

802
Depositing ESD protection circuitry
804
Depositing power switch circuitry sharing at least one component with the ESD protection circuitry

FIG. 8