WHAT IS CLAIMED IS:

1. A system comprising:

an ingestible event marker composition that is activated by contacting a target physiological site and does not include an active agent;

a signal receiver configured to receive a signal produced by said ingestible event marker, wherein said receiver is sized to be stably associated with a living subject in a manner that does not substantially impact movement of said living subject.

2. The system according to Claim 1, wherein said IEM comprises an integrated circuit that includes both a signal generation functional block and a power source functional block.

3. The system according to Claim 2, wherein said power source functional block comprises first and second dissimilar electrode materials.

4. The system according to Claim 3, wherein said first and second electrode materials are present on different surfaces of a solid support that includes said integrated circuit.

5. The system according to Claim 1, wherein said signal receiver comprises at least one electrode.

6. The system according to Claim 1, wherein said signal receiver comprises two electrodes.

7. The system according to Claim 1, wherein said signal receiver further comprises a power generation element.

8. The system according to Claim 1, wherein said signal receiver further comprises a data storage element.

9. The system according to Claim 1, wherein said signal receiver further comprises a physiological sensor.

10. The system according to Claim 9, wherein said physiological sensor is configured to provide data selected from the group consisting of: respiration, heart rate, temperature and blood pressure.

11. The system according to Claim 1, wherein said signal receiver comprises:

(i) first and second electrodes configured to receive a signal;

(ii) a signal demodulator;

(iii) a signal transmitter;

(iv) a data storage element; and

(v) a power source.

12. The system according to Claim 11, wherein said signal receiver includes an integrated circuit that comprises at least one of the elements selected from the group consisting of: (i) first and second electrodes configured to receive a signal; (ii) a signal demodulator; (iii) a signal transmitter; and (iv) a data storage element.

13. The system according to Claim 12, wherein said signal receiver further comprises a clock element.

14. The system according to Claim 13, wherein said signal receiver further comprises a preamplifier.

15. The system according to Claim 14, wherein said signal receiver further comprises a microprocessor.

16. The system according to Claim 11, wherein said first and second electrodes are configured to receive a signal and to sense a biomarker.

17. The system according to Claim 16, wherein said biomarker is selected from the group consisting of: electrocardiogram, heart rate, respiration rate and fluid status.

18. The system according to Claim 16, wherein said signal receiver further comprises a physiological sensor distinct from said first and second electrodes.

19. The system according to Claim 18, wherein said physiological sensor is distinct from said first and second electrodes is selected from the group consisting of: temperature sensor, pressure sensor and analyte detector, motion sensor or a strain gauge.

20. The system according Claim 1, wherein said system further comprises an external data receiver configured to receive data from said signal receiver.

21. The system according to Claim 20, wherein said external data receiver further comprises at least one of a data storage element, a data processing element, a data display element, data transmission element, a notification mechanism, and a user interface.

22. The system according to Claim 21, wherein said external data receiver is selected from the group consisting of: a bedside monitor, a PDA, a cell phone and a PC.

23. An ingestible event marker composition that is activated by contacting a target physiological site and does not include an active agent.

24. The ingestible event marker according to Claim 23, wherein said ingestible event marker comprises an integrated circuit that includes both a signal generation functional block and a power source functional block.

25. The ingestible event marker according to Claim 24, wherein said power source functional block comprises first and second dissimilar electrode materials.

26. The ingestible event marker according to Claim 25, wherein said first and second electrode materials are present on different surfaces of a solid support that includes said integrated circuit.

27. The ingestible event marker according to Claim 23, wherein said event marker comprises a battery element comprising a short resistant series battery.

28. The ingestible event marker according to Claim 27, wherein said short resistant series battery is made up of two or more battery structures.

29. The ingestible event marker according to Claim 28, wherein said battery structures each comprise a chamber having an anode and a cathode.

30. The ingestible event marker according to Claim 29, wherein said chamber includes a fluid entry port and a fluid exit port.

31. The ingestible event marker according to Claim 30, wherein at least one of said ports comprises a semi-permeable membrane.

32. The ingestible event marker according to Claim 28, wherein said two or more battery structures are share a common boundary.

33. The ingestible event marker according to Claim 28, wherein said two or more battery structures do not share a common boundary.

34. The ingestible event marker according to Claim 23, wherein said ingestible event marker comprises a battery element produced using a planar processing protocol.

35. The ingestible event marker according to Claim 34, wherein said ingestible event marker is activated upon contact with a target site fluid present at a target site.

36. The ingestible event marker according to Claim 35, wherein said ingestible event marker comprises:

(i) a solid support;

(ii) first and second electrodes, wherein said first and second electrodes are:

(a) at least partially present on the same surface of said solid support; or

(b) present on different solid supports that are bonded to each other.

37. The ingestible event marker according to Claim 36, wherein said first and second electrodes present on the same surface of said solid support.

38. The ingestible event marker according to Claim 37, wherein said ingestible event marker comprises two cathodes flanking an anode on a top surface of said solid support.

39. The ingestible event marker according to Claim 36, wherein said ingestible event marker comprises a cathode wholly present on a top surface of said solid support and an anode partially present on said top surface and partially present on another surface of said solid support.

40. The ingestible event marker according to Claim 36, wherein said ingestible event marker comprises two or more anodes positioned over a common cathode on a top surface of said solid support.

41. The ingestible event marker according to Claim 36, wherein said ingestible event marker comprises two or more anodes positioned beneath a common cathode on a top surface of said solid support.

42. The ingestible event marker according to Claim 36, wherein said ingestible event marker comprises a chamber bound by a cathode and anode, where said anode comprises one or more openings.

43. The ingestible event marker according to Claim 36, wherein said first and second electrodes are present on different solid supports that are bonded to each other.

44. A method comprising:

(a) administering to a subject an ingestible event marker that is activated by contacting target physiological site and does not include an active agent; and

(b) detecting a signal emitted from said identifier with a signal receiver.

45. The method according to Claim 44, wherein said method further comprises using said signal receiver to sense at least one biomarker of said subject.

46. The method according to Claim 45, wherein said method further comprises transmitting data from said signal receiver to an external data receiver.

47. The method according to Claim 44, wherein said method further comprises implanting a receiver for detecting a signal produced by said identifier at a location of said subject.

48. The method according to Claim 44, wherein said method further comprises associating said receiver with a topical location of said subject.

49. The method according to Claim 48, wherein said method is a method of treating a subject for a disease condition.

50. The method according to Claim 49, wherein said disease condition is a cardiovascular disease condition.

51. The method according to Claim 50, wherein said method further comprises evaluating said subject's response to said agent.

52. The method according to Claim 51, wherein said evaluating further comprises generating a physiological index that is based on data from multiple biomarkers.

53. The method according to Claim 52, wherein said method further comprises adjusting a therapeutic regimen for said subject based on said evaluating.

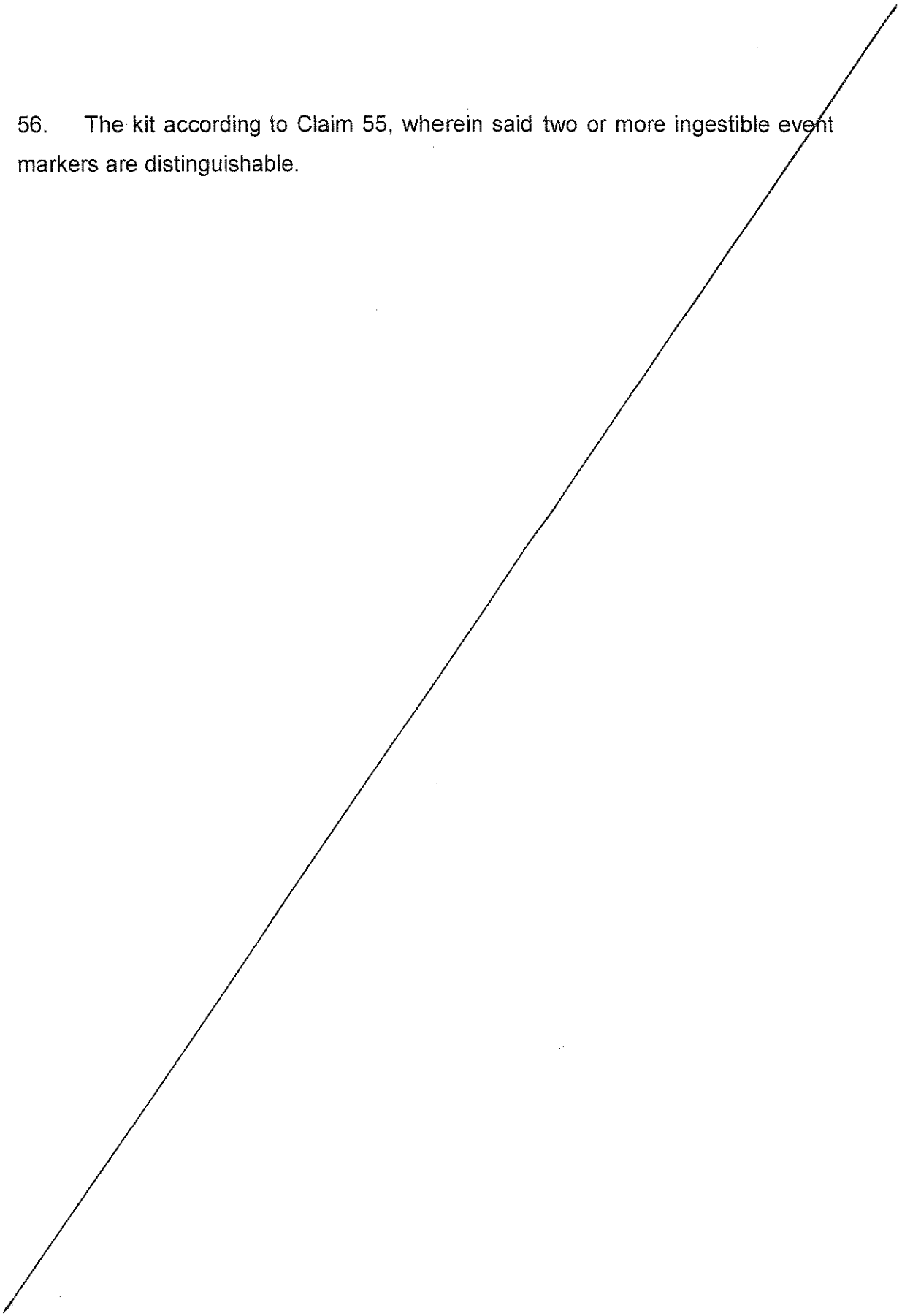
54. A kit comprising:

an ingestible event marker that is activated by contacting a target physiological site and does not include an active agent; and

a signal receiver.

55. The kit according to Claim 54, wherein said kit comprises two or more ingestible event markers.

56. The kit according to Claim 55, wherein said two or more ingestible event markers are distinguishable.



Claims

1. An ingestible event marker comprising:

a battery section including two electrodes to supply a battery voltage upon contacting a body fluid,

an IC circuit to generate an identification code through the two electrodes by changing a current flowing through the body fluid from the two electrodes,

wherein the IC circuit comprises:

a control logic to generate a coded signal representing the identification code,

a power supply circuit coupled to the control logic, and

a capacitor coupled to the control logic and the power supply circuit, the capacitor chargeable by the battery voltage.

2. The ingestible event marker according to claim 1, wherein the power supply circuit further comprises a recharge transistor to couple the battery voltage to the capacitor and to recharge the capacitor based upon a recharge signal from the control logic.

3. The ingestible event marker according to claim 1 or 2, wherein the power supply circuit further comprises a diode to prevent a charge stored in the capacitor to flow back to the electrodes.

4. The ingestible event marker according to claim 3, wherein the diode is a Schottky diode.

5. The ingestible event marker according to any of the preceding claims, wherein the IC circuit further comprises an oscillator coupled to the capacitor and the control logic, the oscillator to produce a clock frequency.

6. The ingestible event marker according to any of the preceding claims, wherein the IC circuit further comprises a switch coupled to the control logic, the switch to change an impedance between the two electrodes.

7. The ingestible event marker according to claim 6, wherein the switch is to change the impedance between the two electrodes based upon the coded signal from the control logic.

8. The ingestible event marker according to claim 6 or 7, wherein the capacitor is to be charged when the switch is turned off.

9. The ingestible event marker according to any of claims 6 to 8, wherein the two electrodes are effectively shorted when the switch is turned on.

10. The ingestible event marker according to any of the preceding claims, wherein the generation of the identification includes a cycle pattern of ON period and OFF period, wherein the OFF period is longer than the ON period.

11. The ingestible event marker according to claim 10, wherein the capacitor is to be charged during the OFF period.

12. The ingestible event marker according to any of the preceding claims, wherein the battery section forms a voltaic cell to produce the battery voltage when the electrodes are coupled with the body fluid.

13. An ingestible event marker comprising:

a battery section including two electrodes to supply a battery voltage upon contacting a body fluid,

an IC circuit comprising:

switch to change an impedance between the two electrodes to generate an identification code through the two electrodes by changing a current flowing through the body fluid from the two electrodes,

a power supply circuit coupled to the switch, and

a capacitor coupled to the power supply circuit, the capacitor chargeable by the battery voltage.

14. The ingestible event marker according to claim 13, wherein the power supply circuit further comprises a recharge transistor to couple the battery voltage to the

capacitor and to recharge the capacitor based upon a recharge signal from the control logic.

15. The ingestible event marker according to claim 13 or 14, wherein the power supply circuit further comprises a diode to prevent a charge stored in the capacitor to flow back to the electrodes.

16. The ingestible event marker according to claim 14, wherein the diode is a Schottky diode.

17. The ingestible event marker according to any of claims 13 to 16, wherein the IC circuit further comprises an oscillator coupled to the capacitor, the oscillator to produce a clock frequency.

18. The ingestible event marker according to any of claims 13 to 17, wherein the switch is to change the impedance between the two electrodes based upon a coded signal.

19. The ingestible event marker according to any of claims 13 to 18, wherein the capacitor is to be charged when the switch is turned off.

20. The ingestible event marker according to any of claims 13 to 19, wherein the two electrodes are effectively shorted when the switch is turned on.

21. The ingestible event marker according to any of claims 13 to 20, wherein the generation of the identification includes a cycle pattern of ON period and OFF period, wherein the OFF period is longer than the ON period.

22. The ingestible event marker according to claim 21, wherein the capacitor is to be charged during the OFF period.

23. The ingestible event marker according to any of claims 13 to 22, wherein the battery section forms a voltaic cell to produce the battery voltage when the electrodes are coupled with the body fluid.