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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. (amended) A magnetic field sensor assembly for sensing a magnetic field created by a magnet, the sensor assembly including;
- 5 at least one sensor having a sensor element;
a magnetisable member located adjacent the sensor element and between the sensor element and the magnet when the sensor is in use, and wherein, in use, the member becomes magnetised by the magnetic field produced by the magnet to create a secondary magnetic field which is detected by the sensor element to thereby boost or increase the localised magnetic flux density produced by the magnet;
- 10 the sensor element being mounted on a sensor board;
- 15 a member holder for holding the magnetisable member; and
biasing means for biasing the magnetisable member into a position adjacent the sensor element.
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2. The assembly of claim 1 wherein the member is a cylindrical rod shaped member having a longitudinal axis which is aligned, in use, in the direction of a line extending between the magnet and the sensor when the sensor passes the magnet.
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3. The assembly of claim 1 or 2 wherein the member is a ferromagnetic member.
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4. The assembly of claim 3 wherein the member is formed from manganese zinc ferrite material having the general formula $MnZn.Fe_2O_3$.
5. The assembly of claim 1 wherein the member is impinged against the sensor element.
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6. The assembly of claim 1 the member has a diameter of about 8 mm and a length of about 40 mm and an initial permeability of 2000.

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7. (amended) The assembly of claim 1 wherein the biasing means is a spring located in the member holder for biasing the member so that it impinges against the sensor element.

10 8. The assembly of claim 7 wherein the member holder is coupled to a holder plate, the holder plate having a screw threaded hole and the member holder having a screw thread for engagement in the screw threaded hole, the sensor board being located adjacent to the holder plate so
15 that the sensor element projects through the screw threaded hole and into the member holder.

9. The assembly of claim 8 wherein the member holder has a base and the spring is disposed between the base and
20 the member for biasing the member against the sensor element.

10. The assembly of claim 8 wherein the member holder has a circumferential flange for engaging a surface of the
25 member plate for limiting the amount of insertion of the member holder into the screw threaded hole when the member holder is screw threaded into the screw threaded hole in the member plate.

30 11. The assembly of claim 1 wherein the sensor comprises a plurality of said sensor elements and said magnetisable members.

12. (amended) An automated guided vehicle system, including;
35 at least one automated guided vehicle, the

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automated guided vehicle having a sensor assembly having at least one sensor, the sensor including a plurality of sensor elements each sensor element having a magnetisable member located adjacent the sensor element;

5 a plurality of magnets arranged along a roadway which is to be traversed by the vehicle for guiding movement of the vehicle along the roadway;

each sensor element having the magnetisable member located adjacent the sensor element so as to be
10 between the sensor element and the magnets when the vehicle passes over the magnets;

wherein when the vehicle passes over the magnets the member becomes magnetised by the magnetic field produced by the magnets to create a secondary magnetic
15 field which is detected by the sensor element to thereby boost or increase the localised magnetic flux density produced by the magnets;

the sensor element being mounted on a sensor board;

20 a member holder for holding the magnetisable member; and

biasing means for biasing the magnetisable member into a position adjacent the sensor element.

25 13. The system of claim 12 wherein the member is a cylindrical rod shaped member having a longitudinal axis which is aligned, in use, in the direction of a line extending between the magnets and the sensor when the sensor passes over the magnet.

30 14. The system of claim 12 or 13 wherein the magnetisable member is a ferromagnetic member.

15. The system of claim 14 wherein the member is
35 formed from manganese zinc ferrite material having the

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general formula $MnZn.Fe_2O_3$.

16. The system of claim 12 wherein the member is impinged against the sensing element.

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17. The system of claim 12 wherein the member has a diameter of about 8 mm and a length of about 40 mm and an initial permeability of 2000.

10 18. (amended) The system of claim 12 wherein the biasing means is a spring located in the member holder for biasing the member so that it impinges against the sensor element.

15 19. The system of claim 18 wherein the member holder is coupled to a holder plate, the holder plate having a screw threaded hole and the member holder having a screw thread for engagement in the screw threaded hole, the sensor board being located adjacent to the holder plate so that the sensor element projects through the screw threaded
20 hole and into the member holder.

20. The system of claim 19 wherein the member holder has a base and the spring is disposed between the base and the member for biasing the member against the sensor
25 element.

21. The system of claim 20 wherein the magnets are ceramic-ferrite magnets of cylindrical shape and have a diameter of about 100 mm and a length of about 50 mm.

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22. (amended) A magnetic field sensor assembly for sensing a magnetic field created by a magnet for the sensor assembly including;

35 at least one sensor element for detecting the magnetic field produced by the magnet; and

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power switching means for selectively switching the sensor elements between a power on level and a power off level.

5 23. The assembly of claim 22 wherein the power switching means comprises a transistor and switching control means for switching the transistor on and off, the transistor having a collector which is connected to the sensor element and an emitter which is connected to ground,
10 the switching control means being connected to the base of the transistor so that when a power on signal is applied to the base the sensor element is connected to ground through the transistor and the sensor element is activated or powered up since potential can be applied across the sensor
15 element between the ground created by the transistor and a sensor power supply to the sensor element, and when the switching control means switches off the transistor, the transistor is switched off to disconnect the sensor element from ground so that there is no potential difference across
20 the sensor element and the sensor element is powered off.

24. The assembly of claim 23 wherein the switching control means switches the sensor elements on and off periodically by supplying high and low signals to turn on
25 and off the transistor.

25. The assembly of claim 24 wherein the sensors are powered on for about 2 ms, then read, and then powered off for at least 1 ms and then powered on again for 2 ms and so
30 on.

26. The assembly of claim 23 wherein the sensor power supply comprises a fixed voltage supplied to the sensor elements.

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27. The assembly of claim 22 wherein each sensor element has a ferromagnetic member located adjacent the sensor element for boosting or increasing a localised magnetic field strength produced by the magnets.

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28. An automated guided vehicle system, including;
at least one vehicle including a magnetic field sensor assembly having at least one sensor element;
a plurality of magnets located along a roadway
10 for guiding movement of the vehicle relative to the magnets; and

switching means for periodically switching power on and off to the at least one sensor element.

15 29. The system of claim 28 wherein the power switch means comprises a transistor and switching control means for switching the transistor on and off, the transistor having a collector which is connected to the sensor element and an emitter which is connected to ground, the switching
20 control means being connected to the base of the transistor so that when a power on signal is applied to the base the sensor element is connected to ground through the transistor and the sensor element is activated or powered up since potential can be applied across the sensor element
25 between the ground created by the transistor and a sensor power supply to the sensor element, and when the switching control means switches off the transistor, the transistor is switched off to disconnect the sensor element from ground so that there is no potential difference across the
30 sensor element and the sensor element is powered off.

30. The system of claim 29 wherein the switching control means switches the sensor elements on and off periodically by supplying high and low signals to turn on
35 and off the transistor.

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31. The system of claim 30 wherein the sensors are powered on for about 2 ms, then read, and then powered off for at least 1 ms and so on.
- 5 32. The system of claim 29 wherein the sensor power supply comprises a fixed voltage supplied to the sensor elements.
- 10 33. The system of claim 28 wherein each sensor element has a ferromagnetic member located adjacent the sensor element for boosting or increasing a localised magnetic flux density produced by the magnets.
- 15 34. A sensor assembly for detecting a magnetic field produced by a magnet, including;
at least one sensor element having first and second power pins and an output pin;
a sensor power supply for supplying power to the
20 first pin of the at least one sensor element, the second pin of the at least one sensor element being coupleable to a reference potential so that power is supplied to the at least one sensor element for powering the at least one sensor element;
25 switching means for selectively powering on or off the at least one sensor element; and
a switching control means for providing a pulsed power signal to the switching means to cause the switching means to intermittently switch power on and off to the at
30 least one sensor element to perform a power reset to the at least one sensor element to eliminate hysteresis within the at least one sensor element.
35. The assembly of claim 34 wherein the switching
35 means is between the second pin and reference potential for

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disconnecting the second pin from the reference potential to power the at least one sensor element off, and wherein when the pulsed power signal is supplied to the switching means the switching means is caused to intermittently
5 disconnect the second pin from the reference voltage so that the at least one sensor element is intermittently powered on and off to perform the power reset.

36. The assembly of claim 34 wherein the switching
10 means is between the first pin and the sensor power supply for disconnecting the first pin from the sensor power supply to power the at least one sensor element off, and wherein when the pulsed power signal is supplied to the
15 switching means the switching means is caused to intermittently disconnect the first pin from the sensor power supply so that the at least one sensor element is intermittently powered on and off to perform the power reset.

20 37. The assembly of claim 36 wherein the switching means comprises a transistor.

38. The assembly of claim 35 wherein the switching
25 means comprises a transistor having a base, a collector and an emitter, the collector being connected to the second pin, the emitter being connected to the reference potential and the base being connected to the switching control means.

30 39. The assembly of claim 35 wherein the reference potential is ground.

40. The assembly of claim 35 wherein the switching
35 control means supplies a pulse signal having a high signal for switching the transistor on and therefore connecting

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the second pin to the reference potential for a period of about 2 ms, and a low signal for switching the transistor off and therefore disconnecting the second pin from the reference potential.

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41. The system of claim 34 wherein the sensor element has a magnetisable member adjacent the sensor element which becomes magnetised by a magnetic field produced by the magnet to increase the localised magnetic flux density for
10 detection by the at least one sensor element.

42. An automated vehicle guidance system for automatically guiding a vehicle relative to a plurality of magnets, said system including;

15 at least one vehicle including at least one magnetic field sensor assembly;

a plurality of magnets arranged along a roadway which the vehicle is to traverse;

the sensor assembly having;

20 at least one sensor element having first and second power pins and an output pin;

a sensor power supply for supplying power to the first pin of the at least one sensor element, the second pin of the at least one sensor element being coupleable to
25 a reference potential so that power is supplied to the at least one sensor element for powering the at least one sensor element;

switching means for selectively powering on and off the at least one sensor element; and

30 a switching control means for providing a pulsed power signal to the switching means to cause the switching means to intermittently switch power on and off to the at least one sensor element to perform a power reset to the at least one sensor element to eliminate hysteresis within the
35 at least one sensor element.

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43. The system of claim 42 wherein the switching means is between the second pin and reference potential for disconnecting the second pin from the reference potential to power the at least one sensor element off, and wherein when the pulsed power signal is supplied to the switching means the switching means is caused to intermittently disconnect the second pin from the reference voltage so that the at least one sensor element is intermittently powered on and off to perform the power reset.

44. The system of claim 42 wherein the switching means is between the first pin and the sensor power supply for disconnecting the first pin from the sensor power supply to power the at least one sensor element off, and wherein when the pulsed power signal is supplied to the switching means the switching means is caused to intermittently disconnect the first pin from the sensor power supply so that the at least one sensor element is intermittently powered on and off to perform the power reset.

45. The system of claim 44 wherein the switching means comprises a transistor.

46. The system of claim 42 wherein the switching means comprises a transistor having a base, a collector and an emitter, the collector being connected to the second pin, the emitter being connected to the reference potential and the base being connected to the switching control means.

47. The system of claim 43 wherein the reference potential is ground.

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48. The system of claim 43 wherein the switching control means supplies a pulse signal having a high signal for switching the transistor on and therefore connecting the second pin to the reference potential for a period of about 2 ms, and a low signal for switching the transistor off and therefore disconnecting the second pin from the reference potential.

49. The system of claim 42 wherein the sensor element has a magnetisable member adjacent the sensor element which becomes magnetised by a magnetic field produced by the magnet to increase the localised magnetic field strength for detection by the at least one sensor element.

50. A magnetic field sensor assembly for detecting a magnetic field created by a magnet, the sensor assembly including;

at least one central sensor array, the central sensor array having a plurality of sensors spaced apart by a predetermined first distance; and

a first side sensor array and a second side sensor array arranged on each side of the central sensor array so as to sandwich the central sensor array therebetween, the first and second side sensor arrays each having a plurality of sensors spaced apart by a second predetermined distance which is greater than the first predetermined distance.

51. The assembly of claim 50 wherein the central sensor array comprises a first central sensor array and a second central sensor array.

52. The assembly of claim 50 wherein the first and second sensor arrays each comprise nine rows and eight columns of magnetic sensor elements.

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53. The assembly of claim 50 wherein the first and second side sensor array also each comprise nine rows and eight columns of magnetic sensor elements.

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54. The assembly of claim 50 wherein each of the sensor arrays are coupled to a processor board for receiving output signals from each sensor array to enable the position of a vehicle to be determined relative to the magnets.

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55. The assembly of claim 54 wherein the processor board is coupleable to a navigation system for determining the position of a vehicle relative to the magnets and for producing control signals for controlling movement of the vehicle in response to the position signals.

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56. The assembly of claim 50 wherein the sensors each comprise a sensor element and a magnetisable member adjacent the sensor element.

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57. An automated guided vehicle system, including;
at least one vehicle including a sensor assembly;
a plurality of magnets located along a roadway
for detection by the sensor to enable the vehicle to be automatically guided relative to the magnets; and
wherein the sensor assembly comprises at least one central sensor array, the central sensor array having a plurality of sensor elements spaced apart by a predetermined first distance, and a first side sensor array and a second side sensor array arranged on each side of the central sensor array so as to sandwich the central sensor array therebetween, the first and second side sensor arrays each having a plurality of sensors spaced apart by a second predetermined distance which is greater than the first

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predetermined distance.

58. The system of claim 57 wherein the central sensor array comprises a first central sensor array and a second central sensor array.

59. The system of claim 57 wherein the first and second sensor arrays each comprise nine rows and eight columns of magnetic sensor elements.

60. The system of claim 57 wherein the first and second side sensor array also each comprise nine rows and eight columns of magnetic sensor elements.

61. The system of claim 57 wherein each of the sensor arrays are coupled to a processor board for receiving output signals from each sensor array to enable the position of a vehicle to be determined relative to the magnets.

62. The system of claim 61 wherein the processor board is coupleable to a navigation system for determining the position of a vehicle relative to the magnets and for producing control signals for controlling movement of the vehicle in response to the position signals.

63. The system of claim 61 wherein the sensors each comprise a sensor element and a magnetisable member adjacent the sensor element.