Claims

1. A device for the detection of at least one interfering body in a system for the inductive transfer of energy, wherein the system for the inductive transfer of energy comprises at least one primary coil unit (18) for generating at least a part of an electromagnetic power transfer field, wherein the device comprises at least one means for the detection of interfering bodies (48, 25, 50), wherein the at least one means for the detection of interfering bodies (48, 25, 50) comprises at least one exciter coil means (12) for generating an exciter field and at least one detector coil means (14) which is associated with the at least one exciter coil means (12), wherein the device comprises at least one evaluation means (25) for detecting a coupling state between the at least one exciter coil means (12) and the at least one detector coil means (14) and/or for detecting a change of the coupling state, wherein the interfering body is detectable as a function of the coupling state and/or of the change of the coupling state, wherein the device comprises at least one compensation means (16) for compensating an electromagnetic influence of the primary coil unit (18) and/or of a secondary coil unit (38) on the coupling state between the at least one exciter coil means (12) and the at least one detector coil means (14), wherein the at least one means for the detection of interfering bodies (48, 25, 50) is constructed separately from the primary coil unit (18),
wherein
the proportion of the power transfer field in the field received by the at least one detector coil means (14) is reducable by the compensation means (16) and/or the proportion of the output signal which is generated by the at least one detector coil means (16) as a function of the received power transfer field is reducable by the compensation means (16), characterized in that the at least one compensation means (16) comprises at least one compensation coil means, wherein a compensation field is generatable by the compensation coil means, wherein at least a part of the power transfer field received by the at least one detection means (14) is compensatable by the compensation field, and/or wherein at least a part of the power transfer field is detectable by the compensation coil means.

2. The device according to Claim 1, characterized in that at least a part of the means for the detection of interfering bodies (48, 25, 50) is arranged on or on an active surface of the primary coil unit (18) and/or in an active volume of the primary coil unit (18).

3. The device according to Claim 1, characterized in that at least a part of the means for the detection of interfering bodies (48, 25, 50) is arranged in the receiving range of the secondary coil unit (38).

4. The device according to one of Claims 1 to 3, characterized in that the at least one exciter coil means (12) and the at least one detector coil means (14) are realized on a carrier constructed as a circuit board (10) in the form of planar inductivities.

5. The device according to Claim 4, characterized in that the at least one exciter coil means (12) and the at least one detector coil means (14) are constructed as planar inductivities on different conductor layers and/or on facing flat sides of the common circuit board (10).

6. The device according to Claim 4 or 5, characterized in that the at least one detector coil means (14) is constructed as a plurality of individual coils adjacent to each other on a surface of a circuit board and/or as a plurality of individual coils arranged at least partially overlapping each other.

7. The device according to one of Claims 1 to 6, characterized in that the at least one exciter coil means (12) is constructed as a coil surrounding the detector coil means (14) at least in sections on the edge.

8. The device according to one of Claims 4 to 7, characterized in that at least one compensation coil means (16) is arranged on or in the circuit board (10).

9. The device according to one of Claims 1 to 8, characterized in that an exciter signal with one or more excitation frequencies and/or an excitation frequency spectrum in the frequency range of 1 kHz to 5 MHz is generated by the exciter signal generation means connected to the at least one exciter coil means (12) by signaling technology.

10. The device according to Claim 9, characterized in that the exciter signal is generated with a plurality of excitation frequencies spectrally separated from each other and/or in an excitation frequency range which is spectrally at least 100 kHz wide.

11. The device according to one of Claims 1 to 10, characterized in that the at least one evaluation means (25) for detecting and evaluating an output signal of the detector coil

means (14) is constructed in such a manner that the output signal is evaluated spectrally over a frequency range of at least 100 kHz and/or for a plurality of carrier frequencies which are spectrally separated from each other.

12. The device according to one of Claims 1 to 11, characterized in that the at least one evaluation means (25) is designed for detecting and evaluating a frequency and/or phases and/or the amplitude of an output signal of the detector coil means (14).

13. The device according to one of Claims 1 to 12, characterized by compensation means (16) designed to compensate an electromagnetic influence of the vehicle on the coupling state between the at least one exciter coil means (12) and the at least one detector coil means (14).

14. A system for the inductive transfer of energy, wherein the system comprises at least one primary coil unit (18) for generating at least a part of an electromagnetic power transfer field and a secondary coil unit (38) for receiving the electromagnetic field generated by the primary coil unit,
characterized in that
the system comprises a device for the detection of an interfering body according to one of Claims 1 to 13.

15. A method for the detection of at least one interfering body in a system for the inductive transfer of energy, wherein the system for the inductive transfer of energy comprises at least one primary coil unit (18) for generating at least a part of an electromagnetic power transfer field, wherein an exciter field is generated by at least one exciter coil means (12) of a means for the detection of interfering bodies (48, 25, 50) and is at least partially received by at least one detector coil means (14) of the means for the detection of interfering bodies (48, 25, 50) which is associated with the at least one exciter coil means (12), wherein a coupling state between the at least one exciter coil means (12) and the at least one detector coil means (14) and/or a change of the coupling state is detected, wherein the interfering body is detected as a function of the coupling state and/or of the change of the coupling state, wherein an electromagnetic influence of the primary coil unit (18) and/or of a secondary coil unit (38) on the coupling state between the at least one exciter coil means (12) and the at least one detector coil means (14) is compensated by at least one compensation means 16), wherein the at least one means

for the detection of interfering bodies (48, 25, 50) is constructed separately from the primary coil unit (18),
characterized in that
the proportion of the power transfer field in the field received by the at least one detector coil means (14) is reduced by the compensation means (16) and/or the proportion of the output signal which is generated by the at least one detector coil means (16) as a function of the received power transfer field is reduced by the compensation means (16).