Claims

1. An inductive power transfer pad, in particular a power transfer pad (1) of a system for inductive power transfer to a vehicle, comprising a stationary part (2) and a movable part (3), wherein the movable part (3) comprises a primary winding structure, wherein the movable part (3) is movable between a retracted state and an extended state, characterized in that
the power transfer pad (1) is designed and/or controllable such that the movable part (3) is only movable to a position from a set of predetermined positions, wherein the set of predetermined positions is a subset of the set of all positions between the retracted and the extended state, wherein the power transfer pad (1) is controllable interval-dependent, wherein the retracted state is assigned to a first interval (I1) of ground clearances of a set of chargeable vehicles and the extended state is assigned to another interval (I2) of ground clearances of the set of chargeable vehicles, wherein the power transfer pad (1) is designed and/or controllable such that in the retracted state and the extended state a minimal air gap height (Amin) is provided, wherein the minimal air gap height (Amin) is larger than zero.

2. The inductive power transfer pad according to claim 1, characterized in that the movable part (3) is only movable to the retracted state or to the extended state.

3. The inductive power transfer pad according to one of the claims 1 or 2, characterized in that the movable part (3) is movable in steps.

4. The inductive power transfer pad according to one of the claims 1 to 3, characterized in that the movable part (3) is movable to a position from the set of predetermined positions such that at least a minimal air gap height (Amin) is provided, wherein the minimal air gap height (Amin) is larger than zero.

~~5. The inductive power transfer pad according to one of the claims 1 to 4, characterized the power transfer pad (1) is controllable interval-dependent, wherein the retracted state is assigned to a first interval (I1) of ground clearances of a set of chargeable vehicles and the extended state is assigned to another interval (I2) of ground clearances of the set of chargeable vehicles, wherein the power transfer pad (1) is designed and/or controllable such that in the retracted state and the extended state a minimal air gap height (Amin) is provided, wherein the minimal air gap height~~

~~(Amin) is larger than zero.~~

~~6.~~5. The power transfer pad according to ~~claim 5~~one of the claims 1 to 4, characterized in that the movable part is controllable depending on a vehicle category, wherein the first interval (I1) of ground clearances is assigned to a first category and the other interval (I2) of ground clearances is assigned to another category.

~~7.~~6. The power transfer pad according to one of the claims ~~5 to 6~~one of the claims 1 to 5, characterized in that a maximal movement of the movable part (3) is determined depending on the minimal ground clearance of the interval comprising the maximal ground clearance of all intervals (I1, I2).

~~8.~~7. The power transfer pad according to one of the claims 1 to ~~7~~6, characterized in that the minimal air gap height (Amin) is chosen from an interval from 20mm to 60mm.

~~9.~~8. The power transfer pad according to one of the claims 1 to ~~8~~7, characterized in that the movable part (3) comprises at least one object detection means.

~~10.~~9. The power transfer pad according to one of the claims 1 to ~~9~~8, characterized in that the stationary part (2) comprises an converter, wherein the stationary part (2) comprises at least one DC connecting terminal for connecting the stationary part to an external DC voltage supply means, wherein an input side of the converter is electrically coupled to the DC connecting terminal and an output side of the converter is electrically coupled to the primary winding structure and/or wherein the stationary part comprises at least one AC connecting terminal for connecting the stationary part to an external AC voltage supply means, wherein the converter is coupled to the AC connecting terminal via a rectifier.

~~11.~~10. The power transfer pad according to one of the claims 1 to ~~10~~9, characterized in that the power transfer pad (1) comprises at least one DC voltage supply unit, wherein the DC voltage supply unit is connected to a DC connecting terminal of the stationary part (2).

~~12.~~11. The power transfer pad according to one of the claims 1 to ~~11~~10, characterized in that the power transfer pad (1) comprises at least one communication means for

communicating with a vehicle.

~~13.~~12. The power transfer pad according to one of the claims 1 to ~~12~~11, characterized in that the power transfer pad comprises a scissor lift (19) or an air actuator (21) or a jack-like lift (23) or a sliding block guide.

~~14.~~13. The power transfer pad according to one of the claims 1 to ~~13~~12, characterized in that at least a portion of the movable part (3) is additionally movable in a second and/or a third direction (x, y) and/or rotatable.

~~15.~~14. An inductive power transfer system, in particular for an inductive energy transfer to a vehicle, comprising an inductive power transfer pad (1) according to one of the claims 1 to 13~~4~~, and at least one receiving device for receiving an alternating electromagnetic field generated by a primary winding structure of the inductive power transfer pad (1).

~~16.~~15. A method of operating an inductive power transfer pad (1), wherein the power transfer pad (1) comprises a stationary part (2) and a movable part (3), wherein the movable part (3) comprises a primary winding structure, wherein the movable part (3) is movable between a retracted state and an extended state,
characterized in that
the movable part (3) is only moved to a position from a set of predetermined positions, wherein the set of predetermined positions is a subset of the set of all positions between the retracted state and the extended state, wherein the power transfer pad (1) is controlled interval-dependent, wherein the movable part (3) is moved to the retracted state if a vehicle with a ground clearance of a first interval (I1) of ground clearances of a set of chargeable vehicles is to be charged, wherein the movable part (3) is moved to the extended state if a vehicle with a ground clearance of another interval of ground clearances is to be charged, wherein the power transfer pad (1) is designed and/or controlled such that in the retracted state and the extended state a minimal air gap height (Amin) is provided, wherein the minimal air gap height (Amin) is larger than zero.

~~17.~~16. The method according to claim ~~16~~15, characterized in that the movable part (3) is moved to a position from the set of predetermined positions such that at least a minimal air gap height (Amin) is provided, wherein the minimal air gap height (Amin) is

larger than zero.

~~18. The method according to claim 16 or 17, characterized in that the power transfer pad (1) is controlled interval-dependent, wherein the movable part (3) is moved to the retracted state if a vehicle with a ground clearance of a first interval (I1) of ground clearances of a set of chargeable vehicles is to be charged, wherein the movable part (3) is moved to the extended state if a vehicle with a ground clearance of another interval of ground clearances is to be charged, wherein the power transfer pad (1) is designed and/or controlled such that in the retracted state and the extended state a minimal air gap height (Amin) is provided, wherein the minimal air gap height (Amin) is larger than zero.~~

~~19.~~17. The method according to one of the claims ~~16~~ 15 to ~~18~~16, characterized in that the movable part (3) is controlled depending on a category of a vehicle arranged above or approaching the power transfer pad.

~~20.~~18. The method according to one of the claims ~~16~~ 15 to ~~19~~17, characterized in that a minimal ground clearance of a vehicle to be charged is determined, wherein the movement of the movable part (3) is controlled depending on the determined minimal ground clearance.

~~21.~~19. The method according to one of the claims ~~16~~ 15 to ~~20~~18, characterized in that a set of chargeable vehicles is divided into more than one category of vehicles, wherein a vehicle to be charged is identified and assigned to one of at least two categories of vehicles, wherein the movable part (3) is moved to a category-dependent position.