Claims

1. A device for connecting a connector of an electric vehicle charger to a socket of an electric vehicle, comprising:

    - a stationary member that forms part of a fixed world and/or the vehicle charger and/or an actuated mechanism;

    - a non-stationary member for carrying the connector, that is displaceable with respect to the stationary member along respective lines substantially parallel to each other by means of both:

    i. an actuated displacement from a default position to an actuated position; and

    ii. a superimposed compliant displacement from the actuated position to an actual position;

    - at least one controllable actuator for accomplishing the actuated displacement;

    - a compliance assembly for accomplishing the compliant displacement;

    - a controller assembly, for

        - controlling the controllable actuator;

        - determining the actual position; and

        - determining the compliant displacement of the non-stationary member;

    characterized in that

    the controller assembly is further configured for taking an intervening action when the compliant displacement exceeds a first threshold; which first threshold is a non-constant function of the actuated position.

2. The device according to claim 1, wherein the intervening action is dependent on the actuated displacement.

3. The device according to claim 1, wherein the intervening action comprises at least one of:

    - changing the actuated displacement or actuated position of the non-stationary member;

    - stopping the actuated displacement or actuated position of the non-stationary member;

    - interrupting the actuated displacement or actuated position of the non-stationary member;

    - changing the speed or direction of the actuated displacement of the non-stationary member;

- displacing the non-stationary member to(ward) a predetermined position;
- changing the mode of control of the actuator, including changing the controller setting to control the force exerted by the actuator and/or to allow a back driven motion;
- cutting the power from the actuator; and
- any combination of the above.

4. The device according to claim 1 or 2, wherein the controller assembly is further configured for determining the compliant displacement by comparing the actual position with the actuated position.

5. The device according to claim 1 or 2, wherein the controller assembly is further configured for determining the compliant displacement from a measured force exerted on the non-stationary member.

6. The device according to any of the preceding claims, wherein the first threshold is a threshold in a first direction of the compliant displacement from the actuated position, wherein the controller is further configured for taking an intervening action when the compliant displacement exceeds a second threshold, wherein the second threshold is a threshold in a second direction, opposite to the first direction, wherein the value of the first and the second threshold differ from each other.

7. The device according to any of the preceding claims, wherein the first and/or second threshold are a function of a momentary speed at which the actuated and/or compliant displacement takes place.

8. The device according to any of the preceding claims, comprising at least one sensor for determining the actual position; and/or determining the compliant displacement of the non-stationary member.

9. The device according to claim 8, wherein the controller assembly is configured for determining the compliant displacement of the non-stationary member based on a signal or on data generated by the at least one sensor.

10. The device according to any of claims 8 or 9, comprising an array of sensors, wherein a first sensor is configured for providing a signal or data that represents the actual position and/or determines proximity of the non-stationary member, and wherein a second sensor is configured for providing a signal or data that represents the compliant displacement of the non-stationary member or a force exerted on the non-stationary member in a direction substantially along the direction of the compliant displacement.

11. The device according to claim 1, wherein the compliance assembly comprises at least two compliance elements, wherein a first compliance element is configured to provide a compliant displacement in a first direction and a second compliance element is configured to provide a compliant displacement in a second direction opposite to the first direction.

12. The device according to claim 11, wherein the compliance assembly is configured such that a stiffness of the first and second compliance elements is different.

13. The device according to claim 1, wherein the actuator is compliantly coupled to the stationary member by a compliant element, is compliantly displaceable by a force exerted on the non-stationary member to which the actuator is mechanically coupled.

14. The device according to claim 13, wherein the compliant element provides the actuator with a compliant displacement in one degree of freedom.

15. The device according to claim 11, wherein the compliance elements are configured to allow a non-linear response to the compliant displacement, such that the reactive force increases or decreases non-linearly with the magnitude of the compliant displacement.

16. A method for operating a device for connecting a connector of an electric vehicle charger to a socket of an electric vehicle, the device comprising:

- a stationary member that;

    - forms part of a fixed world and/or the vehicle charger and/or an actuated mechanism;

- a non-stationary member:

    - for carrying a connector;

    - that is displaceable with respect to the stationary member along respective lines substantially parallel to each other by means of both:

        i. an actuated displacement from a default position to an actuated position; and

        ii. a superimposed compliant displacement from the actuated position to an actual position;

- at least one controllable actuator for accomplishing the actuated displacement;

- a compliance assembly for accomplishing the compliant displacement;

- the method comprising the steps of:

    - controlling the controllable actuator;

    - determining the actual position; and

- determining the compliant displacement of the non-stationary member;

characterized by

- taking an intervening action when the compliant displacement exceeds a first threshold;

which first threshold is a non-constant function of the actuated position.