**CLAIMS**

1. A vehicle gripping system, comprising:

a sliding wheel gripper slidably coupled to and extending downwards from an upper frame, for releasably gripping a vehicle by gripping wheels of the vehicle;

the sliding wheel gripper being longitudinally slidable along the upper frame frame between a release position and a gripping position; and

the sliding wheel gripper comprising first and second arms extending downwards from the upper frame;

in which the first and second arms are longitudinally movable towards each other to the gripping position to enable gripping of the vehicle therebetween, and longitudinally movable away from each other to the release position to enable release of the vehicle.

2. A system according to Claim 1, in which the sliding wheel gripper comprises a first top frame and a second top frame slidably movable in opposite directions relative to the upper frame, and in which the first and second arms extend downwardly from the first and second top frames, respectively.

3. A system according to Claim 1, further comprising first and second gripping devices disposed at an end of the first and second arms, respectively, for gripping the vehicle therebetween.

4. A system according to Claim 3, in which each of the first and second gripping devices comprises:

two rotary shafts for supporting a respective wheel thereupon; and

a liftable stopper for gripping a side of the respective wheel;

in which the vehicle is gripped between the first and second gripping devices by pressure from the respective stoppers.

5. A system according to Claim 4, in which each of the first and second gripping devices further comprises:

a rotary mechanism to cause the liftable stopper to move from a rest position to a raised gripping position.

6. A system according to any of Claims 3 to 5, further comprising a first cable system for moving the first and second arms away from each other, and a second cable system for moving the first and second arms towards each other, in which the first and second cable systems are configured to cause movement of the first and second arms away from each other to release the vehicle to be at a slower speed than movement of the first and second arms towards each other to grip the vehicle.

7. A system according to Claim 6, further comprising a cable lifting arm for moving the second cable system between an upper position and to a lower position.

8. A system according to Claim 7, further comprising:

at least one pressure sensing unit on at least one arm;

in which the pressure sensing unit is configured to detect lowering of the second cable system to the lower position; and

in which the pressure sensing unit is configured to cause the second cable system to decelerate movement of the first and second arms towards each other.

9. A system according to any of Claims 6 to 8, further comprising:

a tension sensing unit positioned to sense tension in the second cable system;

in which the tension sensing unit is configured to detect when tension in the second cable system reaches a threshold tension indicating a vehicle has been gripped; and

in which the tension sensing unit is configured to cause the second cable system to stop movement of the first and second arms.

10. A parking tower, comprising:

a structure having at least two levels and a vertical passageway;

a vehicle gripping system, the vehicle gripping system comprising:

a vertical lift frame vertically movable in the passageway;

a horizontal slide frame slidably coupled to the vertical lift frame and horizontally movable relative to the vertical lift frame and across each level; and

a sliding wheel gripper slidably coupled to and extending downwards from the horizontal slide frame, for releasably gripping a vehicle by gripping wheels of the

vehicle, the sliding wheel gripper being longitudinally slidable along the horizontal slide frame between a release position and a gripping position.

11. A parking tower according to Claim 10, in which at least one parking bay and at least one parking spot is defined in the structure, each of the parking bay and parking spot being provided with horizontal fixed members to enable horizontal movement of the horizontal slide frame across the respective parking bay and parking spot.

12. A parking tower according to Claim 11, in which the vehicle gripping system further comprises:

a pin system comprising:

retractable pins movable between an unanchored position and an anchored position, in which the anchored position of the retractable pins causes the vertical lift frame to be anchored to the fixed members of the parking spot or parking bay;

orientation sensing units configured to sense orientation of the retractable pins, orientation of the retractable pins being indicative of whether the vertical lift frame is level with the fixed members of the parking spot or parking bay, the orientation sensing units being configured to cause vertical movement of the vertical lift frame to stop when the vertical lift frame is level; and

biasing members controllable to cause movement of the retractable pins between the unanchored position and the anchored position.

13. A parking tower according to Claim 12, in which the vertical lift frame is level when there is a vertical difference of 0.5mm or less between the vertical lift frame and the fixed members.

14. A parking tower according to any of Claims 10 to 13, in which the sliding wheel gripper comprises first and second arms extending downwards from the horizontal slide frame;

in which the first and second arms are longitudinally movable towards each other to the gripping position to enable gripping of the vehicle therebetween, and longitudinally movable away from each other to the release position to enable release of the vehicle.

15. A parking tower according to Claim 14, in which the sliding wheel gripper further comprises first and second gripping devices disposed at an end of the first and second arms, respectively, for gripping the vehicle therebetween.

16. A parking tower according to Claim 15, in which each of the first and second gripping devices comprises:

two rotary shafts for supporting a respective wheel thereupon; and

a liftable stopper for gripping a side of the respective wheel;

in which the vehicle is gripped between the first and second gripping devices by pressure from the respective stoppers.

17. A parking tower according to any of Claims 15 to 16, in which the sliding wheel gripper further comprises a first cable system for moving the first and second arms away from each other, and a second cable system for moving the first and second arms towards each other, in which the first and second cable systems are configured to cause movement of the first and second arms away from each other to release the vehicle to be at a slower speed than movement of the first and second arms towards each other to grip the vehicle.

18. A parking tower according to Claim 17, in which the sliding wheel gripper further comprises:

at least one pressure sensing unit on at least one arm;

in which the pressure sensing unit is configured to detect lowering of the second cable system to the lower position; and

in which the pressure sensing unit is configured to cause the second cable system to decelerate movement of the first and second arms towards each other.

19. A parking tower according to Claim 17 or 18, in which the sliding wheel gripper further comprises:

a tension sensing unit positioned to sense tension in the second cable system;

in which the tension sensing unit is configured to detect when tension in the second cable system reaches a threshold tension indicating a vehicle has been gripped; and

in which the tension sensing unit is configured to cause the second cable system to stop movement of the first and second arms.

20. A parking system comprising a plurality of the parking towers of any of Claims 10 to 19.