

1 Description

1 Title

Fully automatic, mobile device and corresponding process for the fast and economical parking of private vehicles with minimum space requirement.

2 Technical field

The invention concerns a device (FIG. 1) and a method for centering the private vehicles on a platform, gripping them and transporting them quickly, in order to park them in a space-saving way, and upon request getting them again from the parked position automatically and handing them over to the user.

In combination with a modular design, such that this device can be quickly and easily mounted, dismantled and remounted, this is a less costly alternative for the indoor car parks, parking silos, multi-storeyed car parks and similar systems with a higher utilisation of space.

3 State of the art technology

Private vehicles are parked on the road, in parking lots, in garages, multi-storeyed car parks or also in access-controlled automated parking systems. In the typical multi-storeyed car parks, only about 40% of the ground area and around 30% of the enclosed volume can be used for parking the private vehicles. While an average automobile is about 1.7 m wide, 1.6 m high and 4.4 m long, which results in a cubic volume of around 12 m³, the regular multi-storeyed car parks and parking systems include a volume of up to 80 m³ and more per vehicle. In contrast to the earlier models, the modern cars with their compact motors are no longer rectangular in their shape. These taper conically or in oval shape mainly at the front, starting from the rear-view mirror at the side, for which reason a rectangular parking area cannot be used optimally. A lot of valuable space is thus lost in the usual parking systems through entry and exit paths, manoeuvring, space for opening doors, stairs, lifts, footway, solid pillars and beams, the minimum floor height for persons, as well as escape routes,

illumination and fire-extinguishing systems etc. Parking needs time and skill and is perceived as unpleasant.

In other systems the cars are lifted high with lifting systems, in order to save place, and then these are parked closely by staff (valet parking). This makes parking more expensive and increases the access time.

In the existing parking systems, it is necessary to drive-in the car exactly in a parking slot for parking, where the driver automatically receives instructions for cantering the vehicle on a palette. These palettes, which are needed for displacing the vehicle, show a rectangular area with the minimum length and width of the largest car to be parked, plus tolerances for inaccurate parking and manoeuvring. As such, more area is needed than the effective average ground area of the vehicle. Furthermore, before each parking these palettes must be procured or replaced, which needs a complicated mechanism and extensive control and consumes a lot of time and space.

In case of other systems with fixed platforms hanging from vertical chains, which can be seen occasionally in Asia, the enclosed space can be used only poorly and the long access time restricts the actual number of parking spots.

The known systems are designed as fixed structures, which do not permit an economical and quick parking and hence are suitable only for the long-term permanent usage. The long construction time, high investments and the long-term retention have an investment-dampening effect.

4 Detailed description and embodiment of the invention

Task of the invention

The tasks of the invention are to devise a simple technical device and an automated method to park the private vehicles quickly and economically with minimum space requirement and to retrieve them quickly for the users upon their request.

In order that the vehicles can be parked as closely and precisely as possible, taking the car in and out of the storage should be done automatically.

To do this, the modern shapes and the different sizes of the cars should be taken into account for an optimum parking. To keep the usage costs below the current level, the device should be manageable with fewer persons or even without an operator, and it should have low maintenance, minimum susceptibility to faults and high reliability. In order to make the device suitable for temporarily available parcels of lands and gaps between buildings, and for temporary solutions, it should be devised in a simple modular design with little effort, which can be remounted quickly, if needed.

Sub-tasks

In order that the vehicles can be gripped mechanically, displaced and parked precisely, these must first be positioned correctly. To do this precisely and without errors, it cannot be left to the customers. Placing the vehicle must be simple. Even when the vehicle is not placed correctly, the system must fulfil its task. The **first sub-task** is thus to centre the vehicle automatically by mechanical means and to bring it in a uniform, precise position for the mechanical and electronic collection.

The vehicles should be moved and stored automatically through a simple technique without any means of transportation. The **second sub-task** is to grip the vehicles accurately and quickly by means of a method, so as to move it to the assigned position and to pull it out of this again. For this, the components must be designed in such a way that these can grip the vehicle at an appropriate point, suitable for all vehicle types, in order to place it on the platform of the lift and on the parking ramp, and finally pull the vehicle out of there again and place it on the exit ramp to be handed back to the user, when needed.

The **third sub-task** is to park the vehicles as closely as possible with a smart arrangement, with the least wastage of space and simple construction. The modern basic shapes and the different widths, heights, and lengths of the cars should be used optimally. By means of selected arrangement, the method, the electronic measurement and the IT-supported allocation of the parking positions,

wasted empty spaces are avoided to a large extent and the degree of space utilisation is increased manifold as compared to the conventional systems.

The **fourth sub-task** is to handover the vehicles back to the driver quickly, safely upon request, using a simple and safe design in the direction of traffic, so that the handover is simple and swift.

The **fifth sub-task** is to design the entire system in such a way that this can be erected, dismantled, moved and re-erected with minimal effort, without using cranes, supports and heavy foundations. For this, the components are to be assembled in such a way that they can be reused.

Solutions

(Fig. 1)

The solutions are accordingly represented by a device, which parks the vehicles fully automatically and quickly in a space-saving way by a special arrangement, takes them out and returns them when demanded. Furthermore, the vehicles are first centred on a parking ramp by means of guide rails and rollers, then gripped at their wheels with the help of a device, brought in the starting position and then moved automatically and precisely without making use of the means of transportation, such as palettes or conveyor belts. This is done by pushing small rollers below the wheels of the vehicle, in order to place the vehicle on these and to move it. With the help of a device - hereinafter referred to as the tractor - on a platform, which is mounted at a central lift, the vehicles can be moved horizontally. On the lifting platform these can then be rotated on the vertical axis and at the same time quickly transported vertically. The complete system is assembled in a modular design with screws and bolts in such a way that it can be dismantled easily when required and then reassembled on another location without making use of any expensive construction machines. The combination of the following individual inventions results in the desired solution with the advantages mentioned above vis-à-vis the existing systems.

1 Parking ramp, cantering and positioning (Fig. 2)

In this solution, the vehicles are cantered automatically and exactly on a parking ramp by driving it on longitudinally aligned rollers (25) on the parking ramp and moving it with side guide rails (21) while driving in the vehicle at the wheels (16) in the middle of the parking ramp (Fig. 2). Rollers on the guide rails prevent the vehicle from over-rolling. Each of these two guide rails is joined mechanically to each other on the front and at the back with two swivel arms (37) and cantering rails (29) and are pressed in the middle by means of a central tension spring (23). However, since the rear arms are pressed away from one another by means of another tension spring (23), the guide rails at the back go to the state of rest in the open position. If the guide rails are pressed away from each other by the front wheels when the vehicle is driven in, then the closing force on the rear arms is increased via the central spring (23) and the guide rails also close at the back. As a result of this, the vehicle can be moved in the centre now only at the back. When the vehicle leaves the parking ramp, the guiding rails go back to their original resting position, conically closed at the front and open at the back. In this way, it becomes ready for driving in the next vehicle. This arrangement does not need any mechanical drive and is maintenance-free to a large extent.

The proper positioning of the vehicle is achieved by instructing the driver to drive till an electronic and mechanical stopper, upon which a stop signal is given to him. The vehicle is now gripped mechanically, measured electronically and a computer determines a suitable parking space for the vehicle. If none is available, the driver - as in the case of a car washer - is instructed to put the steering wheel in neutral, to apply the brakes, to shift the gear to 1 or P, to leave the vehicle and to close the doors. Once this leaving has been registered electronically, any further access is barred with the help of a gate for security. As such, the vehicle is now ready to be parked and the parking ticket can be issued to the driver. To avoid delays, several such parking ramps (Fig. 2) can be placed before one or several unloading zones.

As an alternative, fixed guide rails or rails with mechanical drive can also be used for cantering the vehicle. In the variant of a fixed guide rail, the car is held only within a specific limit of the lateral deviations. These guide rails are

then aligned for the widest vehicle. The exact cantering is then done by the arms (forked rails) (44) of the tractor (Fig. 4a, Fig. 4b), which hit upon the wheels synchronously from inside and thus displace the vehicle to the side and centre it (Z4a1, 42, 37) 2 Tractor (Fig. 4a, Fig. 4b) horizontal displacement

2 Traktor (Fig. 4a, Fig. 4b) horizontal displacement

In order to manage without palettes or conveyor belts, all vehicles must be gripped at a uniform point, suitable for all models. This is done with the help of a device, the tractor (40) (Fig. 4a), which centres the vehicle, grips it at the wheels, lifts it and moves it. The tractor is fixed on the lifting platform and comprises of hydraulically movable tractor rails (tractor rails) (42), at which a parallel swivellable forked rail (forked rail) (44) is fixed on both the sides. Each of these are equipped with two forks (45) each having two fingers with rollers (51) (roller fingers). Each of the roller fingers comprises of one to two rollers (57) and one lifting roller (58). Both the roller fingers of each fork are connected with each other by means of an actuator (pneumatic or hydraulic cylinder) (48) and can run freely together in the forked rail, but are held in the starting position by means of a spring or else the front-most roller finger can be designed as fixed.

The forked rail is connected with the tractor rail via two rods (41) and a slider (43) mounted on the tractor rail with pneumatic or hydraulic actuators. This tractor rail can move over the lifting platform beyond it (31) (Fig. 4a), when is moved in the corresponding direction by two telescopic cylinders or an electro-mechanical drive. The forked rail is pressed by the tractor rail against the wheels, as a result of which the vehicle is moved exactly in the middle and is stable. Subsequently the two roller fingers of each fork are moved together, through which the wheels are lifted on to the lifting rollers (58). When the fingers are closed, these are fixed with the forked rail, in order to transfer the lateral movement to the vehicle. This brings the vehicle in a uniform and precise initial position and can now be measured electronically, so that the computer can determine the optimum parking space.

Next the vehicle — rolling on the roller fingers — is pulled on to the lifting platform (Fig. 4a Tractor position 1). The lifting platform (31) — unless designed to be mobile — now moves to the middle of the lift (61) and then travels vertically to the assigned deck (Tractor position 2). After the lift has rotated to the calculated parking platform — in the reverse process — the tractor discharges the vehicle again (Tractor position 1). The roller fingers then travel away from each other and the forked rails then contract. Thereafter, the tractor retreats back to the lifting platform and is ready for the next vehicle. For discharging the vehicles on the exit platform (9) the lifting platform and the tractor travel in the opposite directions (Tractor position 3), which facilitates the parking in the direction of the traffic.

3 Roller finger (Fig. 5, Fig.4b, Fig.4c) Grip and lift

The transfer of the tensile and impact forces from the tractor (40) to the wheels and the lifting of the vehicle is resolved by the mentioned roller fingers (51). These comprise of one to two rollers (57), which carry a lifting roller (58). The rollers roll on the corresponding platform. The lifting rollers (58) serve for lifting and carrying the wheel. The lifting rollers are designed either as separate rollers or concentric on the same axis as the rollers, where these then have the form of a segment of a barrel and overlay the rollers. (Z5a, 58). In this way the contact surface of the wheels can be enlarged in small increments. The axes of the rollers have a flange (53) on both the sides. The inner flange runs in the forked rail (44), where the drive cylinder (48) is present that contracts the roller fingers. In the open position these roller fingers are held in a certain starting position by means of springs. In the closed position the fingers are mechanically anchored with the rails, in order to transfer the compression and the tensile forces of the tractor to the vehicle. The front-most roller can also be anchored fixed and hence this additional anchoring can be omitted.

4 Lift and lifting platform (Fig. 3 & 6), Transporting and Rotating

The lifting platform (31) comprises of a plate fitted to the parking platform (8). This is placed on the rollers so that it can move horizontally lengthwise against the other platforms and can connect there. This can also be fixed permanently at the lift (at the lift cabin). Its shape is such that it connects centrally with the connecting platforms through the conical or rounded fronts and that the rollers travel over the platform thrusts without hitting. The lifting platform is mounted on a conventional lift (61). This leads to vertical guide rails (65) by means of an upper and lower rail (67) and stabilised. These vertical rails are fixed either (Fig. 6a) at the parking platforms (8) or (Fig. 6b) or, as a variant of the vertical lift carrying pillars (68), which rotate with the lift along the vertical axis. These then form the lift shaft (62). Thus rotating lift shaft, which is supported on the side with rollers (Fig. 6b 64) at the platforms, provides an unrestricted access to this without the hindering guide rails and supports.

The tractor is connected with the lifting platform by means of the mounting of the drive cylinder (48) and through the guide of the tractor rail (42). In case of a movable lifting platform design; so that the lifting platform (31) extending below the front of the vehicle can be moved vertically, it is retracted in the centre position (platform position 2). For discharging the vehicle, the vehicle is gripped in the same way with the tractor on the parking platform, pulled on to the lifting platform and the pushed on to the other side of this (platform position 3) on the exit ramp (9).

5 Parking platform (8) (Fig. 8, Fig. 9)

The parking platform (8) comprises of conical plates (circular discs) with fixing points for suspension or supports. To ensure that these rails do not extend in the overlapping parking areas and manoeuvring paths, these are placed in the rear part of the platform. The conically converging forms enable close parking. In this way, the rectangular base shapes overlap at the front corners and on the sides. Large vehicles can extend beyond the platform on the sides and the wheels can roll in and out on the adjacent platforms. In case of the movable lifting platform design: The selected front line of the platform enables on one hand the maximum

lifting of the lifting platform, helps it in exact cantering during thrust and enables a smooth transfer of the rollers when the thrusts are transferred. Through the selected suspension of each individual platform no cross rails are necessary, and hence no vertical space is needed and the distance to the ceiling can be kept low. Possible horizontal reinforcements of the plates can be placed at the side margins, where enough space is available.

6 Parking arrangement and method (Fig. 8)

In order that the vehicles can be parked compactly with the least utilisation of space, the cars are pushed on to small, fixed parking platforms (8) in keeping with the conical or oval base forms of the front part of the cars. These are placed star-shaped in a polygon and form a circular disc. With their conically converging front section and rounding the vehicles can thus be parked compactly, in circles, with the front facing the centre point of the circle. This special compact arrangement is enabled by the automatic, without using the displacement of the vehicles done through palettes, through the cantered, exact guiding of the vehicle during parking, through the computer-assisted optimisation and allocation of the positions and through the selected design of the platforms. In this way the rectangular parking ground forms overlap and their paths overlap when the vehicles are being pushed in and pulled out. The conical form in the front and the short front section of the vehicle is used to reduce the distances accordingly. By means of the electronic measurement and gripping of the vehicle done in the angle, these are distributed in such a way on the parking platforms (8) that on the side of each broad car two small cars can be placed, such that the parking distances is further reduced. In this way, space is available only for the average vehicle width for each position and not for the biggest vehicle.

Calculations show that the optimum number of vehicles per deck is around 14 to 20. In case of a higher number the inner space of the circular discs becomes unnecessarily large. If the number of the parking platforms is less, the space in the centre becomes too small or the space requirement for the lift and the lifting platform becomes too large as compared to the usable area.

In contrast to the conventional systems and other automated parking systems with rectangular palettes, the area requirements here is reduced considerably. No movable parts are necessary on the individual parking platforms (8), which makes the design very simple.

Alternatively, the parking platforms (8) can also be shaped and mounted closely in such a way that these form a gap-less circular disc, through which the vehicles can be parked at an angle, depending upon the width of the car, side by side with the least distance. This is enabled by placing the pillars (2) widely outside and supporting the platforms on horizontal rails.

The vertical rails (71) are present in the outer part between the parking platforms. Depending on the arrangement none or only sidewise or radial horizontal rails are necessary below the platforms. In this way, the height of the floors and hence the vertical loss of space can be ignored.

The height of the individual decks i.e. the vertical distance can be decided before mounting and, if necessary, can be adjusted to the requirement with least effort. The vertical distance is to be set for the expected vehicle height to several different deck heights. Because the deck is allocated based on the values measured for the vehicle, each vehicle would require only that much height as necessary. In this way, the space utilisation efficiency is enhanced once again and the increase is about three-fold as compared to the conventional multi-storeyed car parks.

7 Exit ramp and delivery method

The exit ramp (9) comprises of a simple plate, on which the vehicle is pushed by the tractor in the same way as on the parking platform, but in the forward direction. After the vehicle has been pushed on to it, the exit ramp is opened and made accessible to the driver. To avoid delays while driving away, several exit ramps can be placed, which can be supplemented with connecting loading zones.

8 Design

The lift shaft as well as the cover with the parking platforms comprise of elements that can be combined together. By means of a consistent modular design and the use of plug and screw connection, the mounting is quick and easy. In the reverse sequence, the assembly can be dismantled again. Optionally, the cover can also be fixed on to the walls of the building as a hanging or standing structure. The complete plant can be assembled above or also below the ground.

Given the fact that the user has no access to the decks, the emergency devices such as escape routes and fire-extinguishing systems, as also stairs, lifts, illumination and ventilation can be avoided to a large extent. The lift is based on commercial design with the technology used for lifts for carrying people and goods.

4 List of Drawings

1	Drawing 1	Fig. 1	Complete overview of the parking system
2	Drawing 1a	Fig. 1b	Parking system sectional representation 3D
3	Drawing 2	Fig. 2	Parking ramp and centering system Details
4	Drawing 2b	Fig. 2b	Parking ramp and centering system with fixed guide rails
5	Drawing 3	Fig. 3	Lifting platform with tractor
6	Drawing 4a	Fig. 4a	Tractor positions with movable lifting platform
7	Drawing 4a1	Fig. 4a1	Tractor with roller forks operating principle
8	Drawing 4a2	Fig. 4a2	Tractor positions with fixed lifting 9 10 platform
9	Drawing 4b	Fig. 4b	Tractor on the lifting platform (fixed and moving)
10	Drawing 4c	Fig. 4c	Tractor with roller forks
11	Drawing 5a	Fig. 5a	Roller forks with two rollers
12	Drawing 5b	Fig. 5a	Roller forks with 1 roller and overlaid lifting roller
13	Drawing 6a	Fig. 6a	Lift with fixed lift shaft
14	Drawing 6b	Fig. 6b	Lift and lifting platform
15	Drawing 7	Fig. 7	Parking arrangement, arrangement with short and long platforms
16	Drawing 8	Fig. 8	Area comparison
17	Drawing 9	Fig. 9 a, b, c	Erection method and overview of design

Numbers of the components

No	Designation
2	Pillars
4	Ridge support
5	Lift shaft

28	Push rods
29	Centering rails
31	Lifting platform
37	Swivel arms

57	Rolls
58	Lifting rollers
61	Lift
62	Lift Shaft

6	Chassis
8	Parking platform
9	Exit platform
13	Centering spring
16	Car wheel
19	Centering rail
21	Guide rails
22	Parking ramp
23	Tension spring
25	Roll

40	Traktor
41	Rods
42	Traktor rails
43	Slider
44	Forked rails
45	Roller fork
46	Roller finger
48	cylinder
51	Roll fingers
53	Flange

64	Guiding rollers Lift shaft
65	Guiding rails
66	Counter weight
67	Rail
68	carrying pillars
69	Rotational gear of lift
71	Support of platform
71	Holder of platform
73	Pillar, support

2 Patent Claims

1 Generic part

Automatic parking installation for passenger cars

2 Designation of objects

Stationary or mobile device and automatic process for compact, efficient and economical parking of private vehicles.

3 Technical features

The parking device (Fig. 1) comprising of several pillars, rails, or columns (2), to which parking platforms (8) are fixed arranged in circular discs for parking the private vehicles. At the centre of this, on plates, arranged in several decks, stands or hangs a lift shaft in a conventional lift (Fig. 6A / Fig. 6B) with a fixed or movable lifting platform (31) that can be moved back and forth, on which a mechanical push system (tractor) (40) runs on a horizontal rail (tractor rail) (42), which grips the vehicles mechanically at their wheels, centres, lifts and pulls them on to the lifting platform (31). In the design with movable lifting platform this moves first in the centre (position 2). Thereafter, the lift travels vertically to the assigned deck. When the lift (Fig. 6a, Fig. 6b) reaches the corresponding deck and this deck or the entire lift shaft has rotated by the calculated angle or to the platform assigned by the computer, the lifting platform is taken to this deck (position 1), in order to push the car on the parking platform with the tractor. With this method and the selected, overlapping parking arrangement (Fig. 8), the compactness can be enhanced enormously vis-à-vis the conventional systems. When removing the vehicle this is taken back by executing the steps in the reverse sequence and pushed on to the exit ramp (9) (tractor position 3).

Owing to its simplicity and modular design the device assembled, dismantled and assembled again very quickly. To do this, no other constructional measures are needed except for a connection to the power supply and a firm ground.

4 Characterising part

This system is characterised by the fact that it grips the vehicles automatically, parks them quickly and economically in a special arrangement, discharges them again when required and the entire device can be dismantled and re-assembled on another location with minimal effort. Furthermore, it is also characterised by the act that the vehicles are gripped automatically, mechanically and brought to the exact initial position, in order to transport them automatically and precisely, horizontally and vertically and to rotate them on the vertical axis, without need for aids like palettes and conveyor belts.

5 Independent patent claim

Automatic parking system for private vehicles with fixed parking platforms (8) arranged in circular discs on several decks with a central lift (Fig. 6), the connected lifting platform (31), a push and pull device (tractor) (Fig. 4) and with parking and exit ramps, on which the vehicles are cantered and positioned automatically.

This parking system is characterised by the fact that the vehicles are gripped automatically in mechanical fashion, are measured electronically and transported with assistance of computer to specially arranged parking platforms (8), without making use of accessories like palettes, such that this parking method and the selected arrangement (Fig. 8) help to achieve an essentially higher density of the parked cars.

The design is also characterised by the fact that only a few movable parts are needed, which are restricted only to the lift (61), tractor (40), and the parking ramps (22) and the components can be combined together and screwed quickly and easily in modular layout as hanging or supporting structures, such that the entire system is mobile and can be reused.

6 Dependent patent claims

7 Parking ramp with centering system (Fig. 2)

Automatic parking system as per claim 1, with parking ramp, which is characterised by a centering system, which brings the vehicle to the middle of this ramp by means of two guide rails (21). These rails are equipped with rollers that prevent the wheels from ramming against them, without using any mechanical drive for the purpose, such that these guide rails are mechanically connected with one another through swivel arms (37), push rods (28) and cantering rails (29), which are thus in a symmetric position. These rails, kept under tension with springs (23), exercise pressure against the middle of the parking ramp, such that these are pulled away from each other in the front when the vehicle is driven in. At the same time, it results that at the back these come together symmetrically and so push the vehicle with the wheels in the middle of the driveway. The platform is also characterised by the fact that it is designed with rollers (25) laid longitudinally, on which the vehicle wheels (16) can easily be displaced to the side. As an alternative the side guide rails can also be mounted parallel and fixed, in order to keep the lateral deviation of the vehicle within limits.

8 Lift shaft and lifting platform (Fig. 3)

Automatic parking system as per claim 1 with a lifting platform (31), characterised by the fact that this on one hand can be moved forward and back horizontally, and on the other can rotate laterally along the vertical axis and also has the suitable shape and dimensions, so that it can move below the parked front of the car and can join the parking platforms (8) arranged in circle, as also the parking ramps (22) and the exit ramp (9). The lifting platform is also characterised by the fact that the tractor (40), a mechanical gripping and pushing system, is mounted on a rail which is cantered and is movable, in order to pull the vehicles on the lifting platform or to push them from this on to other platforms. As an alternative the lifting platform can be connected permanently with the lift. Similarly, as an alternative, the lift, together with the lift shaft can be designed such that it can rotate on the vertical axis. (Fig. 4a, 31). This is then characterised by the feature that it can be rotated with rollers between the pillars of the lift shaft (Fig. 6b, 65, 68 Fig. 9c, 68) and parking platforms guided on the side via an

electromechanical, hydraulic or pneumatic drive (Z9, Fig9c, 69), electronically controlled, along the vertical axis. This ensures an exact cantering and less gaps between the lifting platform and the parking platform.

9 Tractor (Fig. 4)

Automatic parking system as per claim 1 is characterised by the fact that the vehicles are gripped, cantered and moved on their wheels, without using aids like palettes or conveyor belts, when this component, hereinafter referred to as Tractor (Fig. 4, 40), is on a rail fixed in the middle of the lifting platform (31). On this, it runs below the vehicle placed on the parking ramp, presses at the wheels with two rails (forked rails) (44) that can spread, thereby centres the car exactly and raises the car to some extent with four forks (45) each having two roller fingers (46), which are pushed under the wheels, fixes the vehicle and pulls or pushes it in the desired position.

10 Roller fork (Fig. 5)

Automatic parking system as per claim 1 characterised by the fact that the vehicle is gripped, lifted and pushed on each wheel with a roller fork (45), each comprising of two roller fingers (46) with horizontal rollers on its rollers (57).

This roller fork (45) is characterised by the feature that it is fixed in such a way at a rail (forked rail) (44) that its two roller fingers, comprising of one or two rollers (57) running on the platform, which carry a third roller (lifting roller) (58) and travel below the wheel of the vehicle when pulled together and lift it thereby. The lifting rollers can run either on a separate axis between and parallel to the rollers, or can be overlaid on this concentric to the roller (Fig.5a, 58, Fig.4a1, 46). In this case the lifting roller comprises of a segment of a roller, which runs over the roller and has the form of a segment of a barrel, on which a straight or a concave plate is set to enlarge the bearing surface of the wheel.

11 Parking platform, arrangement and parking method (Fig. 8, Fig. 9)

Automatic parking system as per claim 1 with a parking arrangement and a corresponding parking platform (8), characterised by the fact that by using the conical or oval front sections of the modern automobiles, with corresponding dimensions and specific assignment of this, the vehicles can be parked compactly side by side, when these are cantered precisely and moved automatically without using palettes or similar aids, the parking platforms have a specific basic shape and an arrangement in a circular disc and at an angle of 15 to 30 degrees and the optimum space is assigned to the cars with a computer, when broad and narrow vehicles receive the corresponding parking positions. As such the arrangement is characterised by the fact that the rectangular parking areas overlap with the front edges and the side margins, and very little space is needed for manoeuvring and for transporting. Furthermore, it is also possible to manage without vertical and horizontal rails, which reduce space in the usable area.