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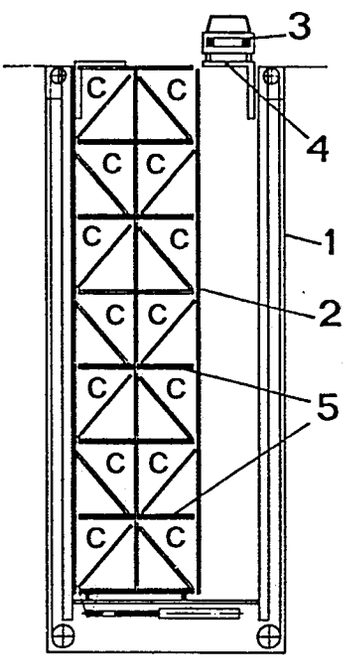
(54) Car park installation with regenerable area and multicellular container.

(57) Multistory, extremely compact car park installation operated both manually and completely automatically, with access area 4 regenerable by means of removing the car 3 occupying it and depositing it in a suitable multicellular container 2, called a tower.



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Car park installation with regenerable area and multicellular container

Soc. PRO.DINT

The invention involves a car park installation with a mobile multi-cell container and a continuously regenerable parking area.

The need in areas with high population and traffic densities to provide an ever increasing number of parking places has generally led to the complete exhaustion of the already few areas available, due in part to the low ratios between the number of parking places usable and the area occupied by conventional car parks. A partial solution to the problem has been the construction of multistory parking lots with access ramps for cars. The major disadvantages of these parking lots are:

- the user must drive around the access ramps in his own car in search of an empty place, with considerable time wasted;
- a large part of the useful space is taken up to quarantee the necessary circulation of the cars with access ramps;
- inside the parking lot there are always a certain number of cars in motion, with conseguent risks of fire;
- since people move about inside the parking lot, they run the risk of being trapped in case of fire;

- the unit construction volume is high, and the space occupied by each parking place in height and floor space is excessive with respect to that absolutely required, since the pedestrian users must be able to move about comfortably;
- there is a high risk of theft and vandalism inside the parking lot.

The aim of this invention is to rationalize as well as possible the solution to the parking problem, both underground and aboveground, eliminating all the disadvantages described above, to obtain:

- rapid parking;
- elimination of wasted space for access ramps;
- decreased risk of fire by eliminating car traffic inside the parking lot;
- elimination of the risk of fire to people;
- low unit volume, corresponding practically to that absolutely necessary for the car;
- elimination of the risks of theft and vandalism.

This aim is achieved according to the invention with an installation characterized by the presence of a regenerable parking area which may be used by a high number of cars, in contrast precisely because of its dynamic regeneration character with the usual concept of the static parking place taken up by one car.

The installation is represented in an exemplificative and non-limiting embodiment in the attached drawings which show in vertical schematization the following operating phases:

figure 1 - car entrance;

figure 2 - search for empty space;

figure 3 - tower advancement;

figure 4 - small fork lowering;

figure 5 - tower return;

figure 6 - search for free board;

figure 7 - second tower advancement;

figure 8 - small fork raising;

figure 9 - second tower return;

figure 10 - fork return.

With reference to the details in the figures, the installation according to the invention consists of an underground well or verticall elevated structure 1, containing a multicellular tower 2, which can be moved horizontally and with mechanical transmission of known type on the bottom of said well or structure 1, which can receive the cars 3 brought to the various levels from two or more portions 4 of the parking lot consisting of forks of a known type bearing a board 5 and moveable vertically in a known fashion so that each car is deposited with the entire support board 5 on the inside of each cell C, with subsequent extraction of said forks, upon movement of said tower 2 and return

of portions 4 to their starting positions, after the recovery of another board 5 from one of the still empty cells.

With reference to the phases shown in the figures, operation of the invention may be described as follows:
fig. 1 : car entrance : Parking area 4 is ready for use and equipped with considerable space around it, allowing ready access by anyone, handicapped persons included. The user car 3 thus enters and is left by both driver and passengers before the next operating phase. Suitable safety devices may be installed to ensure that this take place.

Fig. 2 : search of empty space: once all the people have gotten out, only that part of the parking area absolutely necessary is moved along with the car along the multicellular container 2, arranged as tower or in any other way, in search of an empty cell C.

Figures 3, 4 and 5 : car deposit: then, in seguence, the tower 2 is moved, the forks supporting the board 5 bearing the car 3 are lowered slightly, and returned inside the tower 2 so that the car 3 is deposited in the cell C found available, while the dimensions of said cell may be held to that strictly necessary, with considerable savings in unit volume.

Figures 6, 7, 8, 9, 10 : regeneration of parking area: the following operations are performed in sequence: search for a new board 5 in an empty cell C, displace-

ment of the tower 2 for insertion of the forks under said board 5, slight raising of the forks bearing the board 5 and return inside the tower 2 so as to leave free the trajectory of the rising forks with board 5, in the starting position, thus regenerating the parking area 4, returning to the conditions in figure 1 and placing the system in position for the next operation. This operation may be either car exit or entrance:

- car entrance: the described cycle is repeated. This of course is possible as long as there are available places C in the car container 2. Once these are all used, the area 4 can no longer be regenerated until one of the parked cars exits;
- car exit: the cycle described above is executed starting from the phase in figure 10 in reverse order up to the phase in figure 1; obviously the free board 5 is deposited rather than withdrawn and the car 3 is withdrawn rather than deposited.

A striking characteristic of the invention consists of the presence of 2 or more parking areas 4, in symmetrical positions, so that the multiple functioning allows two or more vertical columns of cells C for cars 3 to be placed in tower 2.

The advantages arising from application of the installation according to the aims of the invention, are:

- rapid parking, given the extreme simplificity of the

operations the user must perform to leave and take his car;

- elimination of wasted space due to access ramps, which together with the small volume of the parking places leads to a considerable increase in the ratio of parking places to the total area occupied, resulting in decreased unit costs of realization;
- reduction of the risk of fire for the cars and elimination of it for people, since circulation inside the car park is eliminated and evacuation of the area during the phase of car deposit is greatly facilitated;
- elimination of the risks of theft and vandalism, since the cars are deposited in a clearly visible and safe area and since access to the cells by extraneous persons is impossible.

Naturally, while the principle of the finding remains the same, the forms of realization and the details of construction may be varied widely with respect to that described and illustrated here, without going beyond the bounds of the invention.

Claims

1. Car park installation with regenerable parking area 4 mobile in a vertical sense with respect to a multicellular container or tower 2, which is mobile horizontally.

2. Car park installation according to claim 1 characterized by a subterranean well 1 to contain the multicellular tower 2 which can be moved horizontally.

3. Car park installation according to claim 1 characterized by an elevated container 1 with the multicellular tower 2, moveable horizontally.

4. Car park installation according to claim 1 characterized by the fact that the parking area 4 consists of forks of a known type with boards 5, moving vertically.

5. Car park installation according to claim 1 characterized by the fact that the cars 3 placed in the parking area 4 are moved vertically until they are in correspondence with an empty cell C of the tower 2.

6. Car park installation according to claim 1

characterized by the fact that the cars 3 are placed in the cell C of the tower 2 after the horizontal displacement of said tower.

7. Car park installation according to claim 1 characterized by the fact that said forks support the cars 3 with the relative boards 5 in the empty cells and, by moving into the tower 2, are released to search for another board 5 so that they can bring it to the starting level to regenerate the parking area 4.

8. Car park installation according to claim 1 characterized by the presence of several parking areas 4, moveable vertically, arranged in symmetrical positions in the well 1 so as to allow placement of the cars 3 in several vertical columns of cells C, realized in the tower 2.

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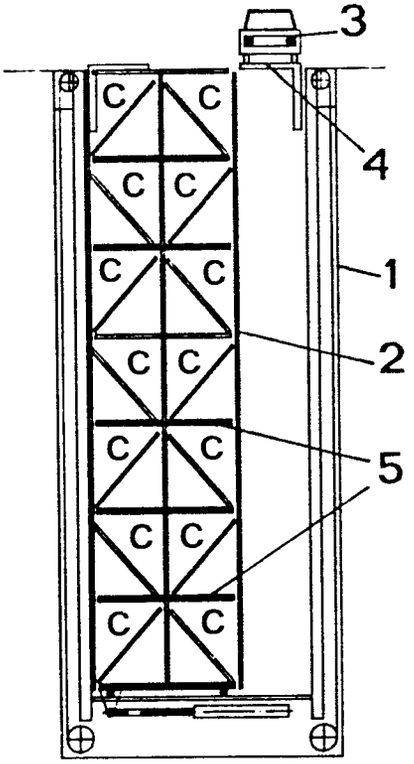


FIG.1

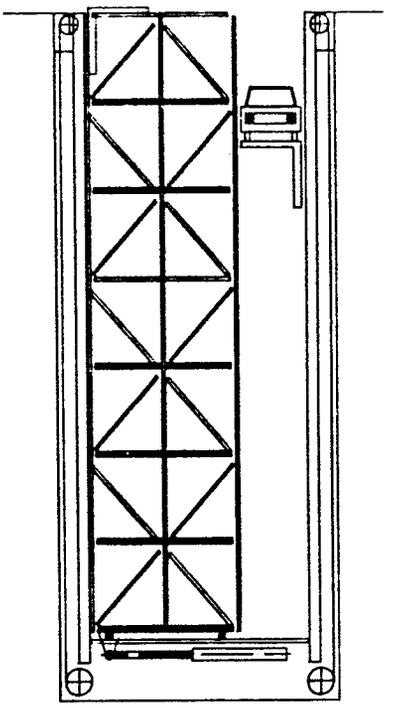


FIG.2

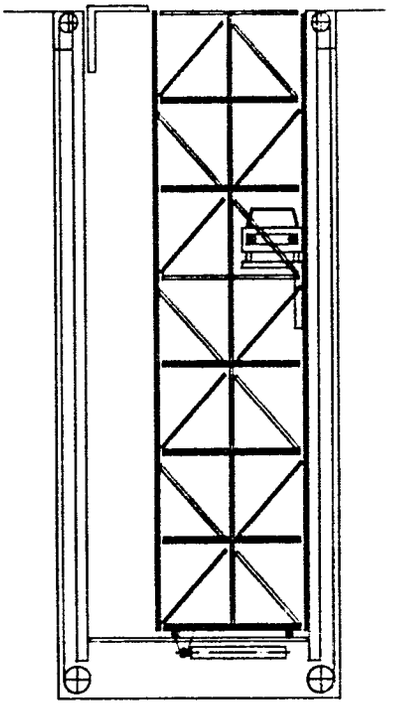


FIG.3

FIG.4

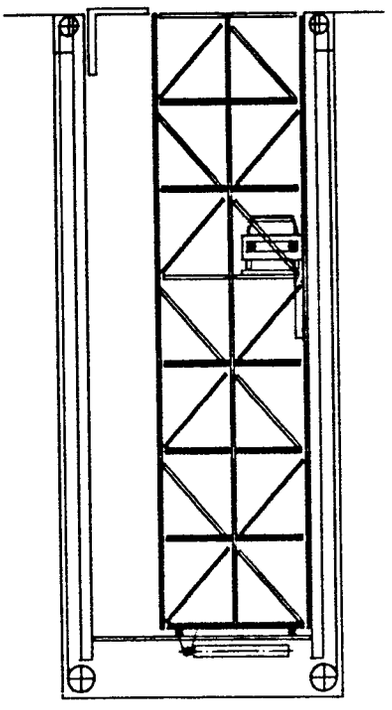


FIG.5

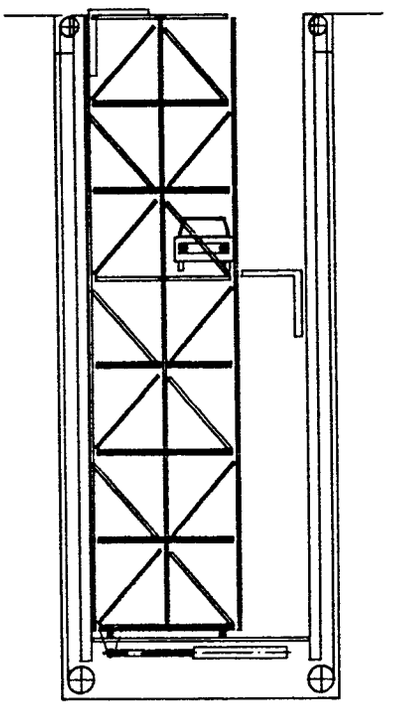
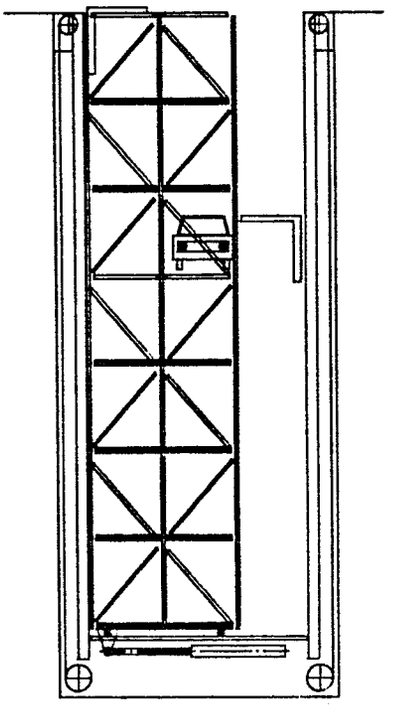


FIG.6



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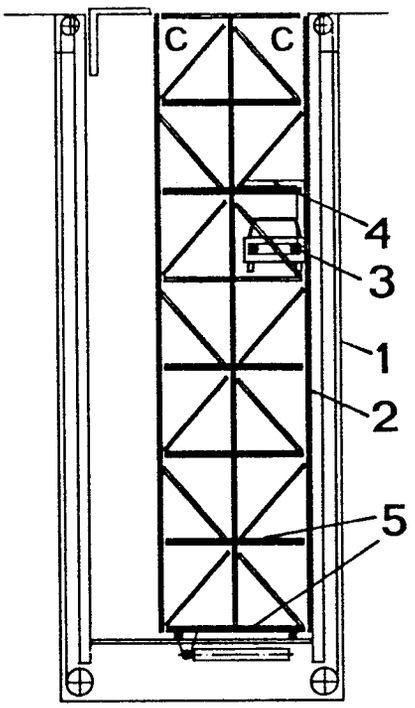

FIG.7

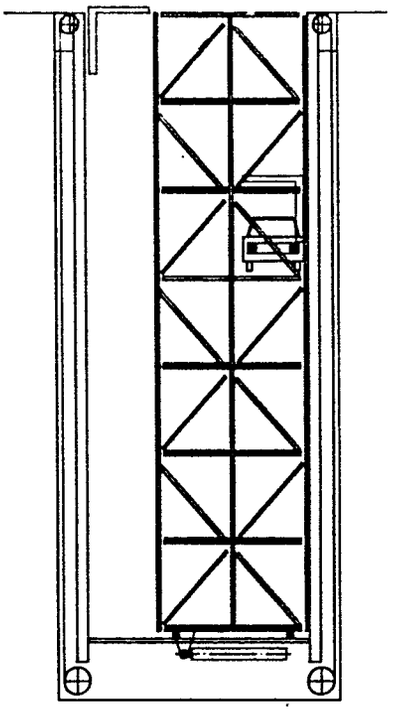

FIG.8

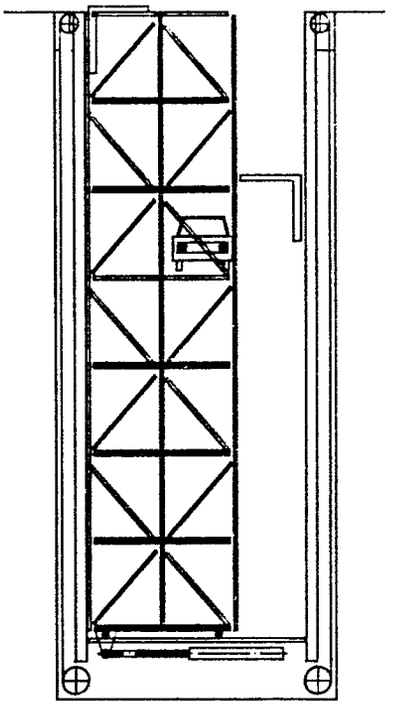

FIG.9

FIG.10