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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2005/0281640 A1****Chen**(43) **Pub. Date:****Dec. 22, 2005**(54) **MULTI-STOREY PARKING GARAGE**

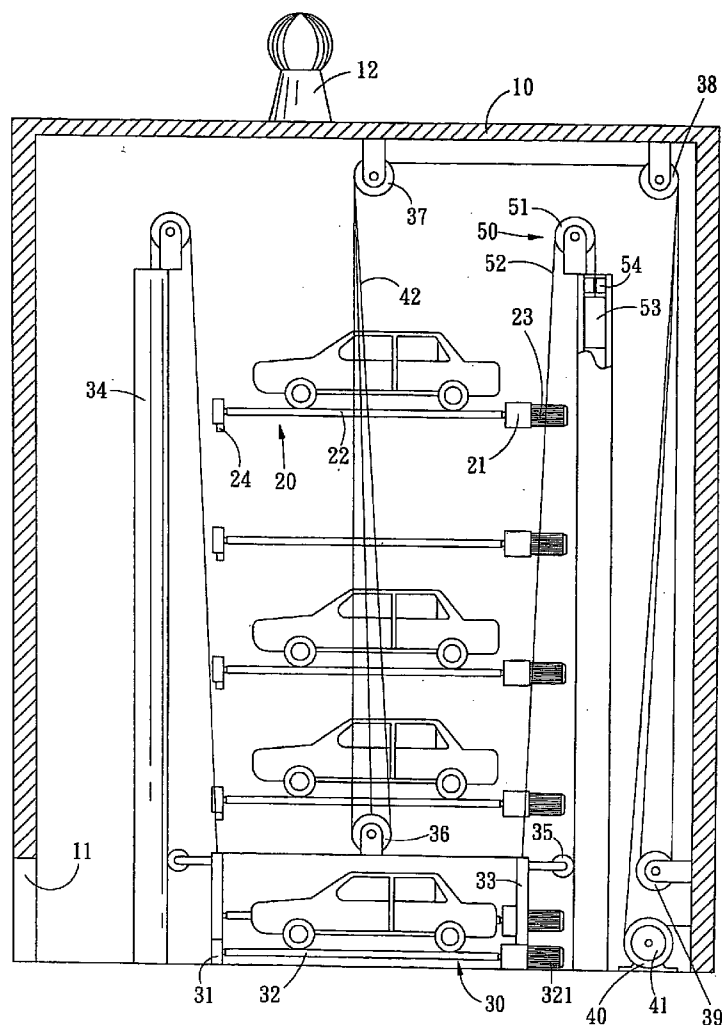
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ABSTRACT(76) Inventor: **Tzu-I Chen**, Kaohsiung City (TW)

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The present invention relate to a multi-storey parking garage including a main body, pallet mechanisms inwardly disposed on the main body, and an elevator mechanism disposed at a center position of the main body. Guiding pillars are disposed around the elevator mechanism, supporting guiding wheels are disposed outside the elevator mechanism, and a slow dropping mechanism is disposed on a top of the guiding pillar for stabilizing the motion of the elevator mechanism. The steel rope forward and backward reels for decreasing the loading of a driving device. The driving device is disposed on the ground for convenient maintenance. The ventilation device is disposed on a top surface of the main body and the window structure is disposed on the side of the main body for better ventilation. A smoke detector, an automatic fire fighting system, etc. are disposed above each pallet mechanism so as to have better safety.



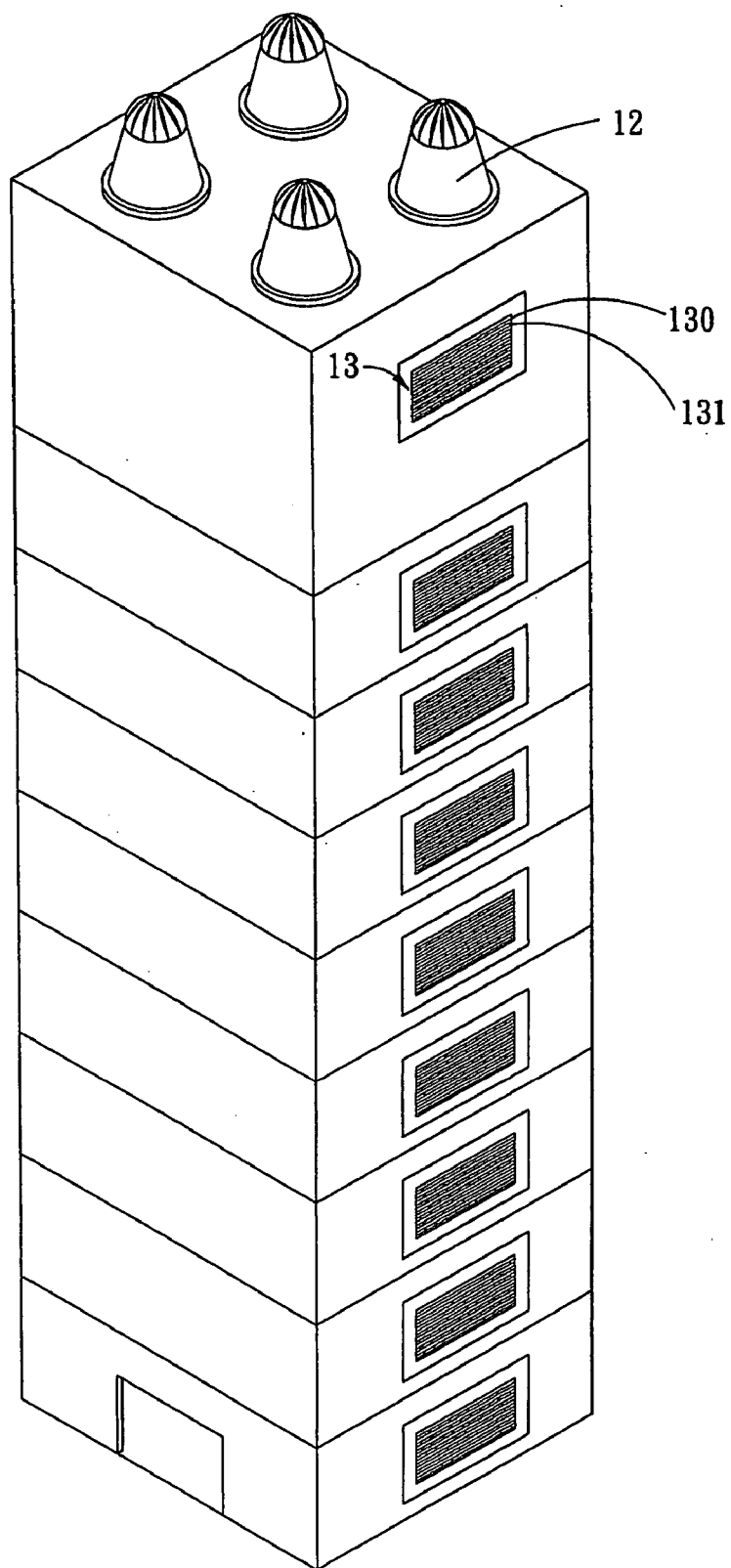


Fig. 1

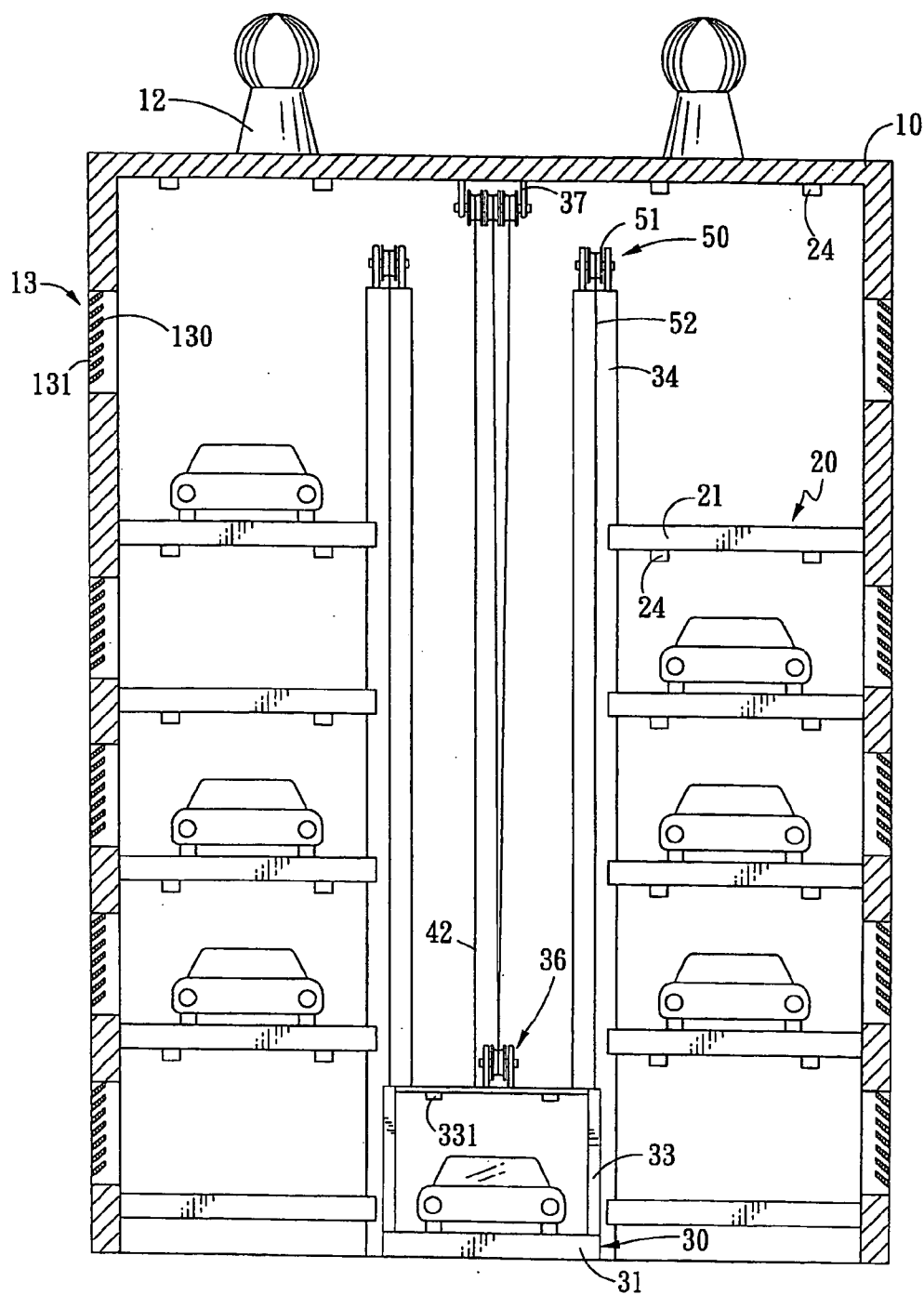


Fig. 2

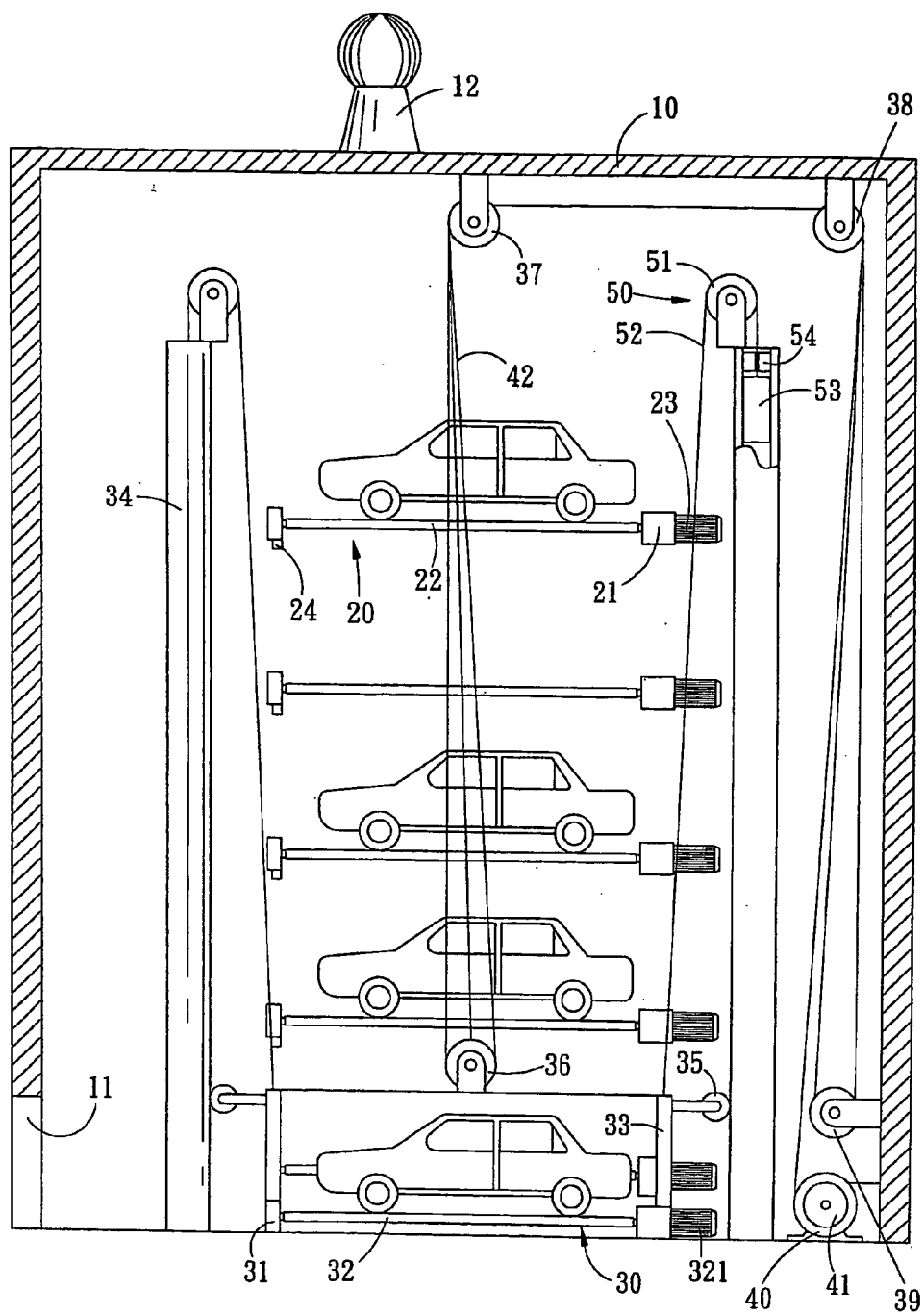


Fig. 3

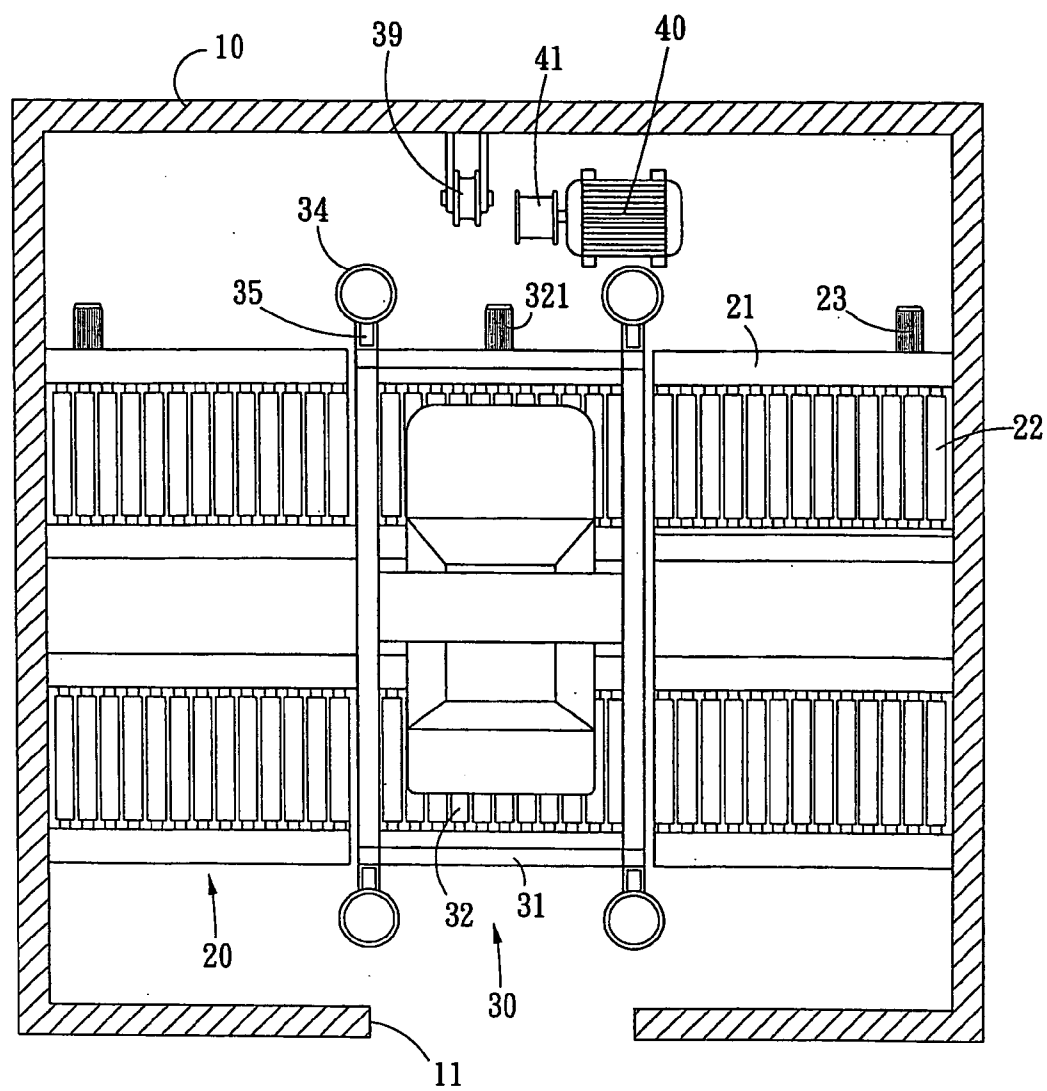


Fig. 4

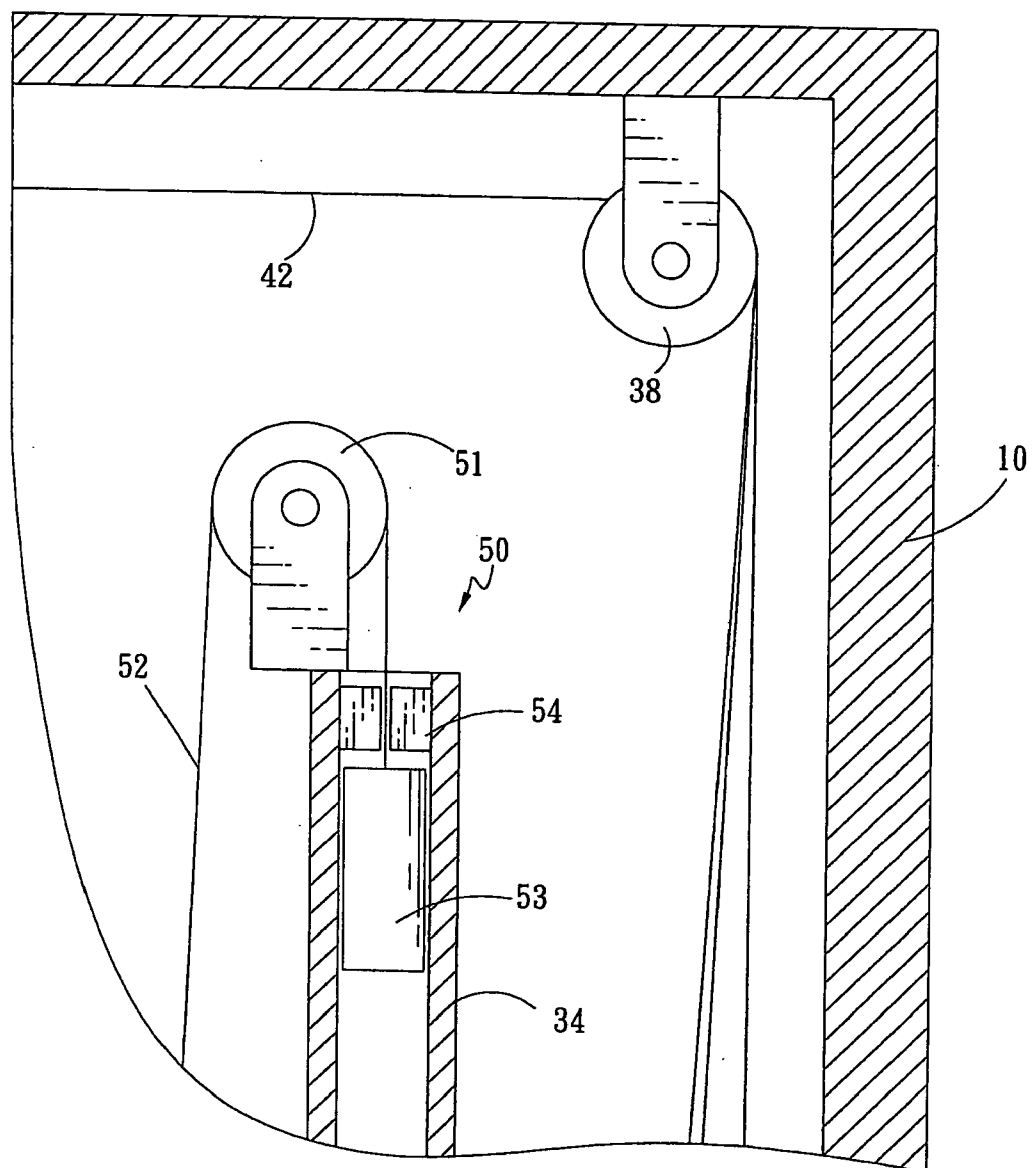


Fig. 5

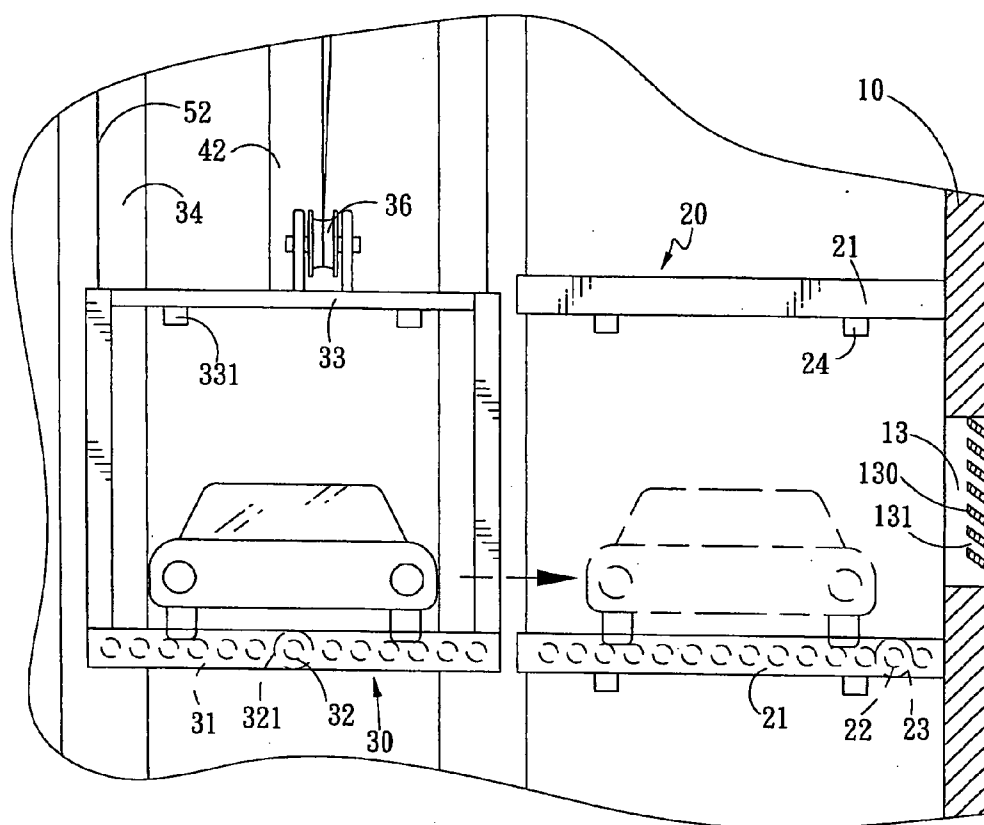


Fig. 6

MULTI-STOREY PARKING GARAGE

FIELD OF THE INVENTION

[0001] The present invention relates to a multi-storey parking garage, and more particularly to a multi-storey parking garage having following advantages of: decreasing the loading of the motor, stabilizing the motion upward and downward, convenient maintenance, better ventilation, and better safety for fire fighting.

BACKGROUND OF THE INVENTION

[0002] Recently, popular parking areas are parking spaces which are disposed on a road or ring road, a horizontal parking garage, a underground parking garage, etc. However, the parking spaces which are provided by the above-mentioned parking area are still restricted. Particularly, the parking spaces which are disposed on a road easily become a part of the road because the road is enlarged. The parking spaces which are disposed on a road cannot be used because the road is constructed. Although the horizontal parking garage and the underground parking garage includes more centralized and faultless parking spaces, it is not yet helpful to economize an fully perform the space. Thus, if the restricted horizontal space is upward expanded to three-dimensional space, and then a faultless multi-storey parking garage can be planned for being a first task of city development and city planning.

[0003] Thus, in the past businessmen have developed actively the structure of the multi-storey parking garage. However, the main power resource and motor of the multi-storey parking garage are disposed above a top surface of a main body thereof. During maintenance, a repairer must climb for repairing the main power resource and the motor of the multi-storey parking garage so as to result in inconvenient maintenance. Furthermore, the weight of a vehicle is directly put on the motor so as to result in the motor with too large loading.

[0004] Accordingly, there exists a need for a multi-storey parking garage having following advantages of: decreasing the loading of the motor, stabilizing the motion upward and downward, convenient maintenance, better ventilation, and better safety for fire fighting.

SUMMARY OF THE INVENTION

[0005] It is an object of the present invention to provide a multi-storey parking garage having following advantages of: decreasing the loading of the motor, stabilizing the motion upward and downward, convenient maintenance, better ventilation, and better safety for fire fighting.

[0006] In order to achieve the foregoing objects, the present invention provides a multi-storey parking garage including a main body, two rows of pallet mechanisms respectively inwardly disposed on two side of the main body, and an elevator mechanism disposed at a center position between the two rows of pallet mechanisms. A plurality of guiding pillars vertically disposed around the elevator mechanism, a plurality of supporting guiding wheels disposed outside the elevator mechanism for transversely supporting the guiding pillars, and a slow dropping mechanism disposed on a top of the guiding pillar for stabilizing the motion of the elevator mechanism upward

and downward. Furthermore, the steel rope forward and backward reels among the first, second, third and fourth pulley combinations for decreasing the loading of a driving device. In addition, the driving device is disposed on the ground for convenient maintenance. The ventilation device is disposed on a top surface of the main body and the window structure is disposed on the side of the main body for better ventilation. A smoke detector, an automatic fire fighting system, etc. are disposed above each pallet mechanism so as to have better safety for fire fighting.

[0007] The foregoing, as well as additional objects, features and advantages of the invention will be more readily apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective view of a multi-storey parking garage of the present invention.

[0009] FIG. 2 is a front elevational view of a multi-storey parking garage of the present invention.

[0010] FIG. 3 is a side elevational view of a multi-storey parking garage of the present invention.

[0011] FIG. 4 is a top plan view of a multi-storey parking garage of the present invention.

[0012] FIG. 5 is a partially expanded view of a slow dropping mechanism of a multi-storey parking garage of the present invention.

[0013] FIG. 6 is a partially expanded view of a multi-storey parking garage of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Referring to FIGS. 1-4, they depict a multi-storey parking garage of the present invention. The multi-storey parking garage includes a main body 10 which has a hollow interior. The main body 10 is provided with an entrance/exit 11 disposed at a front, bottom and center position thereof. A ventilation device 12 is disposed on a top surface of the main body 10. Two window structures 13 are respectively disposed on two sides of the main body 10 which are opposite to each other. The window structure 13 is constituted by a plurality of separating sheets 130 which are arranged in a row. Each separating sheet 130 has a shape which slants to the bottom for prevent from rainwater. A plurality of spacers 131 are disposed between adjacent separating sheets 130 for ventilation. Two rows of pallet mechanisms 20 are respectively disposed on the two side of the interior of the main body 10, and an elevator mechanism 30 is disposed at the center position between the two rows of pallet mechanisms 20.

[0015] The pallet mechanisms 20 includes two rack frames 21 which mounted on the side of the interior of the main body 10, and a plurality of rollers 22 are disposed between two rack frames 21. The rollers 22 must be simultaneously driven by a motor 23 which can be clockwise or anti-clockwise rotated. A smoke detector, an automatic fire fighting system, etc. are disposed above each pallet mechanism 20.

[0016] The elevator mechanism 30 includes two bottom frames 31 which is provided with a plurality of rollers 32

disposed between two bottom frames 31. The rollers 32 must be simultaneously driven by a motor 321 which can be clockwise or anti-clockwise rotated. A frame body 33 is expanded from the two bottom frames 31. Four guiding pillars 34 are vertically disposed around four corners of the two bottom frames 31, and four supporting guiding wheels 35 are disposed outside the frame body 33 for transversely supporting the guiding pillars 34. In addition, a first pulley combination 36 is disposed on a top surface of the frame body 33, a second pulley combination 37 and a third pulley combination 38 are disposed on an inside top surface of the main body 10 and a fourth pulley combination 39 and a driving device 40 are disposed behind the frame body 33 and on the ground. The driving device 40 can drive a reeling shaft 41, and a steel rope 42 which reels the reeling shaft 41 reels the third pulley combination 38, the second pulley combination 37 and the first pulley combination 36 in sequence. Then, in the different direction the steel rope 42 which reels the second pulley combination 37, the third pulley combination 38 and the fourth pulley combination 39 in sequence. Finally, the steel rope 42 which reels the third pulley combination 38 and the second pulley combination 37, and is mounted to the top surface of the frame body 33.

[0017] Referring FIG. 5, a slow dropping mechanism 50 is disposed on a top of the guiding pillar 34, and the guiding pillar 34 has a hollow interior. A guiding wheel 51 is disposed at a position of the top of the guiding pillar 34. Four auxiliary steel ropes 52 are respectively mounted on the four corners of the top surface of the frame body 33, and the auxiliary steel rope 52 reels the guiding wheel 51 and then enters the interior of the guiding pillar 34. A heavy block 53 is mounted at an end of the auxiliary steel ropes 52 which is located in the interior of the guiding pillar 34. Furthermore, a braking mechanism 54 is disposed at a top of the interior of the guiding pillar 34.

[0018] Referring to FIG. 6, the elevator mechanism 30 is upward removed to a proper position by the diving device 40 when the diving device 40 drives the steel rope 42. All the rollers 32, 22 of the elevator mechanism 30 and the pallet mechanism 20 are respectively driven by motors 23, 321 and then rotated in the same direction (e.g. clockwise) for removing the vehicle from the elevator mechanism 30 to the pallet mechanism 20. Furthermore, sensors 24, 331 sense the position of the vehicle, and a circuitry controls the motors 23, 321 whether the motors 23, 321 are started. In other words, all the rollers 32, 22 of the elevator mechanism 30 and the pallet mechanism 20 are driven by motors 23, 321 and then rotated in the different direction (e.g. anti-clockwise) so as to remove the vehicle from the pallet mechanism 20 to the elevator mechanism 30.

[0019] As described above, the multi-storey parking garage of the present invention has following advantages of: decreasing the loading of the driving device, stabilizing the motion upward and downward, convenient maintenance, better ventilation, and better safety for fire fighting.

[0020] (1). Decreasing the loading of the driving device: The weight of the elevator mechanism and the vehicle is scattered and share by the first, second, third and fourth pulley combinations for decreasing the loading of the driving device, because the steel rope forward and backward reels among the first, second, third and fourth pulley combinations.

[0021] (2). Stabilizing the motion upward and downward: The guiding pillars are disposed around the frame body of the elevator mechanism and the supporting guiding wheels are disposed outside the frame body for transversely supporting the guiding pillars so as to guide the motion of the elevator mechanism upward and downward. Furthermore, the slow dropping mechanism is disposed on the top of the guiding pillar so as to keep the stability of the elevator mechanism during removing.

[0022] (3). Convenient maintenance: The driving device is disposed on the ground, such that a repairer does not need to climb the parking garage but conveniently maintain the driving device.

[0023] (4). Better ventilation: The ventilation device is disposed on a top surface of the main body and the window structure is disposed on the side of the main body for prevent from rainy water so as to have better ventilation.

[0024] (5). Better safety for fire fighting: A smoke detector, an automatic fire fighting system, etc. are disposed above each pallet mechanism so as to provide the vehicle with better safety for fire fighting.

[0025] Although the invention has been explained in relation to its preferred embodiment, it is not used to limit the invention. It is to be understood that many other possible modifications and variations can be made by those skilled in the art without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. A multi-storey parking garage comprising:

a main body provided with an entrance/exit disposed at a front position thereof; two rows of pallet mechanisms respectively inwardly disposed on two side of the main body;

and an elevator mechanism disposed at a center position between the two rows of pallet mechanisms and having a frame body for supporting a vehicle; characterized in that the multi-storey parking garage further comprises:

a plurality of guiding pillars vertically disposed around a plurality of corners of the frame body; a plurality of supporting guiding wheels disposed outside the frame body for transversely supporting the guiding pillars; a first pulley combination disposed on a top surface of the frame body; a second pulley combination and a third pulley combination 38 disposed on an inside top surface of the main body; a fourth pulley combination and a driving device disposed behind the frame body and on the ground; and a steel rope reeling the driving device, then reeling forward and backward among the first, second, third and fourth pulley combinations, and finally mounted to the top surface of the frame body.

2. The multi-storey parking garage according to claim 1, wherein the pallet mechanisms comprises two rack frames inward mounted on the side of the main body; and a plurality of rollers disposed between two rack frames and simultaneously driven by a motor which is clockwise or anti-clockwise rotated.

3. The multi-storey parking garage according to claim 1, wherein the elevator mechanism comprises two bottom frames disposed under the frame body; and a plurality of

rollers disposed between two bottom frames and simultaneously driven by a motor which is clockwise or anti-clockwise rotated.

4. The multi-storey parking garage according to claim 1, further comprising a slow dropping mechanism disposed on a top of the guiding pillar and comprising: a guiding wheel disposed on the top of the guiding pillar; a plurality of auxiliary steel ropes mounted on the corners of the top surface of the frame body, reeling the guiding wheel, and then entering a hollow interior of the guiding pillar; and a heavy block mounted at an end of the auxiliary steel ropes.

5. The multi-storey parking garage according to claim 1, further comprising a ventilation device disposed on the top surface of the main body; and two window structures respectively disposed on the two sides of the main body which are opposite to each other.

6. The multi-storey parking garage according to claim 5, wherein the window structure comprises a plurality of separating sheets arranged in a row and having a shape which slants to the bottom for prevent from rain water; and a plurality spacers disposed between adjacent separating sheets for ventilation.

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