

GATE OF PARKING LOT AND PARKING SPACE WITH DISPLAY FUNCTION

FIELD OF THE INVENTION

[0001] The present invention relates to a gate of parking lot and parking space, and more particularly to a gate of parking lot and parking space with display function.

BACKGROUND OF THE INVENTION

[0002] In a conventional parking lot, a ticket card machine and a lifting fence are disposed at the entrance. When a vehicle travels to the front of the lifting fence and the vehicle driver picks up a ticket card from the ticket card machine, the lifting fence is automatically lifted and then the driver can drive the vehicle into the parking lot. Similarly, another ticket card machine and another lifting fence are also disposed at the exit of the parking lot. In addition, a sensing device for sensing vehicles is also disposed at the entrance and exit of a conventional parking lot to lower the lifting fence after a vehicle passes through the lifting fence. However, due to the misjudgment of the sensing device or other factors, the conventional parking lot may lower the lifting fence when the vehicle not yet completely passed through the lifting fence. As a result, the driver may get frightened and the lifting fence or vehicle may get damage.

[0003] In addition, at the entrance and exit of a conventional parking lot, there is only a bar of the lifting fence in the front of the line of sight of the vehicle driver. Therefore, if the parking lot manager needs to provide vehicle drivers with some information, the only possible way is to hang a warning strip on the bar of the lifting fence. However, the hanging space

provided by the bar is limited and the line of sight of the vehicle driver may be blocked. As a result, the conventional parking lot can provide the vehicle driver with limited information.

[0004] In addition, in a conventional parking lot, a detecting device (an ultrasonic device or an image capturing device) is generally used to detect whether a parking grid is occupied by a vehicle. Furthermore, indicating lights which are electrically connected to the detecting device are used to guide and remind the vehicle driving who is seeking an available parking grid. However, the indicating lights used in a conventional parking are usually disposed above the parking grid and therefore can only provide limited light signal information.

SUMMARY OF THE INVENTION

[0005] Therefore, one objective of the present invention is to provide a gate of parking lot capable of improving the problems caused by the conventional lifting fence and displaying information thereon.

[0006] Another objective of the present invention is to provide a parking space with display function capable of displaying information thereon.

[0007] In order to achieve the above-mentioned advantages, an embodiment of the present invention provides a gate of parking lot applied to a parking lot. The gate of parking lot includes a door frame, a mist curtain generating device and a projection device. The door frame is disposed in a lane of the parking lot. The mist curtain generating device is disposed in the door frame and configured to form a mist curtain between the door frame and the lane. The projection device is configured to provide an image beam to the mist curtain to form an image picture on

the mist curtain.

[0008] In one embodiment of the present invention, the aforementioned door frame includes a main body and a plurality of support columns. The main body is opposite to the lane. The support columns stand on the lane and configured to support the main body.

[0009] In one embodiment of the present invention, the aforementioned mist curtain generating device includes at least one atomizing module and at least one airflow generating device. The atomizing module is disposed in the door frame. Each atomizing module includes a liquid accommodating tank and at least one atomizer. The liquid accommodating tank is configured to accommodate a liquid. The atomizer is disposed in the liquid accommodating tank and configured to atomize the liquid in the liquid accommodating tank to form an atomized liquid. The airflow generating device is disposed in the door frame and configured to generate at least one flow of air to allow the atomized liquid to flow in the space between the door frame and the lane, thereby forming the mist curtain.

[0010] In one embodiment of the present invention, each of the aforementioned atomizing modules further includes a liquid level sensor. The liquid level sensor is disposed in the liquid accommodating tank and configured to sense a liquid level of the liquid accommodating tank. The mist curtain generating device further includes a liquid replenishing module which is electrically connected to the liquid level sensor and connected to the liquid accommodating tank.

[0011] In one embodiment of the present invention, the aforementioned mist curtain generating device further includes at least one indicating light which is disposed on the door frame and electrically

connected to the liquid level sensor.

[0012] In one embodiment of the present invention, the aforementioned liquid replenishing module includes at least one liquid recovery machine, a recovery pipe line and a water extraction motor. The liquid recovery machine is disposed in at least one of the support columns and configured to recovery the atomized liquid of the mist curtain. The recovery pipe line is connected between the at least one liquid recovery machine and the liquid accommodating tank. The water extraction motor is disposed to the recovery pipe line and electrically connected to the liquid level sensor. The water extraction motor is configured to feed the liquid recovered by the liquid recovery device to the liquid accommodating tank.

[0013] In one embodiment of the present invention, the aforementioned liquid replenishing module further includes a liquid supply pipe line and a valve member. The liquid supply pipe line is connected between a liquid source and the liquid accommodating tank. The valve member is disposed to the liquid supply pipe line and electrically connected to the liquid level sensor.

[0014] In one embodiment of the present invention, the aforementioned at least one atomizing module is disposed in the main body. The airflow generating device is disposed beside the liquid accommodating tank.

[0015] In one embodiment of the present invention, the aforementioned at least one atomizing module is disposed in at least one of the support columns. Each of the atomizing modules further includes at least one atomized liquid tube connected between the liquid accommodating tank and the main body to guide the atomized liquid to the

main body.

[0016] In one embodiment of the present invention, the aforementioned gate of parking lot further includes a detecting device and a control device. The detecting device is disposed above the lane and configured to detect a vehicle. The control device is disposed in the door frame and electrically connected to the detecting device, the mist curtain generating device and the projection device. The control device is configured to control the projection device and the mist curtain generating device based on a detection result of the detecting device.

[0017] In order to achieve the above-mentioned advantages, an embodiment of the present invention provides a parking space with display function, which includes a parking grid, a mist curtain generating device and a projection device. The mist curtain generating device is fixed above the parking grid and configured to form a mist curtain between the mist curtain generating device and the parking grid. The projection device is configured to provide an image beam to the mist curtain to form an image picture on the mist curtain.

[0018] In one embodiment of the present invention, the aforementioned mist curtain generating device includes a liquid accommodating tank, an atomizer and an airflow generating device. The liquid accommodating tank is configured to accommodate a liquid. The atomizer is disposed in the liquid accommodating tank and configured to atomize the liquid in the liquid accommodating tank to form an atomized liquid. The airflow generating device is disposed beside the liquid accommodating tank and configured to generate at least one flow of air to allow the atomized liquid to flow in the space between the mist curtain generating device and the parking grid, thereby forming the mist curtain.

[0019] In one embodiment of the present invention, the aforementioned parking space with display function further includes a detecting device disposed above the parking grid.

[0020] In summary, the present invention provides a gate of parking lot, in which a mist curtain is formed between a door frame and a lane of the parking lot. An image beam is projected on the mist curtain by a projection device, so an image picture with stop or pass sign can be displayed on the mist curtain; therefore, the gate of parking lot of the present invention has the function of access control. Meanwhile, because the vehicle driver can see through the mist curtain, the driver can control the vehicle to safely pass through the mist curtain, thereby effectively solving the problems caused by the conventional lifting fence. In addition, since the gate of parking lot can display the image picture on the mist curtain to provide the vehicle driver with variable information, the problem that the conventional parking lot can only provide limited information is improved. In addition, the present invention further provides a parking space with display function, in which a mist curtain generating device is fixed above a parking grid. After the mist curtain is formed between the mist curtain generating device and the parking grid, an image beam can be projected on the mist curtain by a projection device, so an image picture is displayed on the mist curtain. The image picture can be a variety of information, depending on the design requirements.

BRIEF DESCRIPTION OF THE DRAWING

[0021] FIG. 1 is a schematic view of a gate of parking lot in accordance with an embodiment of the present invention;

[0022] FIG. 2 is a schematic view of a mist curtain generating device

of a gate of parking lot in accordance with an embodiment of the present invention;

[0023] FIG. 3 is a schematic view of a liquid replenishing module in accordance with an embodiment of the present invention;

[0024] FIG. 4 is a schematic view of a liquid replenishing module in accordance with another embodiment of the present invention;

[0025] FIG. 5 is a schematic view of a gate of parking lot in accordance with another embodiment of the present invention;

[0026] FIG. 6 is a schematic view of the main body of the door frame of the gate of parking lot of FIG. 5 in accordance with an embodiment of the present invention; and

[0027] FIG. 7 is a schematic view of a parking space with display function in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0028] The present invention will now be described more specifically with reference to the following embodiments. It is noted that the following descriptions of preferred embodiments of this invention are presented herein for purpose of illustration and description only. It is not intended to be exhaustive or to be limited to the precise form disclosed.

[0029] FIG. 1 is a schematic view of a gate of parking lot in accordance with an embodiment of the present invention. As shown in FIG. 1, the gate of parking lot 100 of the present embodiment is applied to a parking lot, and the gate of parking lot 100 includes a door frame 110, a mist curtain generating device 120 and a projection device 130. The door frame 110 is disposed on a lane A of the parking lot, and the mist curtain generating device 120 is disposed in the door frame 110. The mist

curtain generating device 120 is configured to form a mist curtain S between the door frame 110 and the lane A. The projection device 130 is configured to provide an image beam L to the mist curtain S to form an image picture I on the mist curtain S.

[0030] The projection device 130 projects the image beam L toward the mist curtain S, but the specific position of the projection device 130 is not limited to that shown in FIG. 1. The projection device 130 may be connected to a control device 170 which is disposed in the door frame 110. The control device 170 is configured to control the projection device 130 to form various image pictures I on the mist curtain S, thereby providing variable information for viewing. The image picture I may be a variety of information depending on requirements, such as parking lot information or advertising information. The present invention does not restrict the specific shape and configuration of the mist curtain S and the image picture I. In one embodiment, the maximum brightness that the projection device 130 can provide is about 3000 lumens thereby clearly displaying the image picture I, but the present invention is not limited to the above parameter range and may be adjusted depending on different design requirements or different environments.

[0031] The door frame 110 includes, for example, a main body 111 and a plurality of support columns 112. The main body 111 is opposite to the lane A. The support columns 112 stand on the lane A and support the main body 111. In the present embodiment, one side of the main body 111 adjacent to the lane A has, for example, at least one mist outlet 1111, and the number of the support columns 112 is, for example, two. The two support columns 112 are disposed between the main body 111 and the lane A, and they are for fixing the main body 111 above the lane A.

However, the specific shapes of the main body 111 and the support column 112 are not limited to those shown in FIG. 1.

[0032] FIG. 2 is a schematic view of a mist curtain generating device of a gate of parking lot in accordance with an embodiment of the present invention. Please refer to FIGs. 1 and 2 together. The mist curtain generating device 120 of the present embodiment includes at least one atomizing module 190 and at least one airflow generating device 123 disposed in the door frame 110, respectively. FIG. 2 is exemplified by one atomizing module 190 in combination with two airflow generating devices 123. In other embodiments, a plurality of atomizing modules 190 may be disposed in the door frame 110; and the number of the airflow generating device 123 used in combination with each atomizing module 190 may be one or plural, or a plurality of atomizing modules 190 may be used in combination with a group of airflow generating devices 123 or in the same airflow generating device 123. Each of the atomizing modules 190 includes a liquid accommodating tank 121 and at least one atomizer 122. The liquid accommodating tank 121 is configured to accommodate a liquid W1. The atomizer 122 is disposed in the liquid accommodating tank 121 and is configured to atomize the liquid W1 in the liquid accommodating tank 121 to form an atomized liquid W2. One or more atomizers 122 may be disposed in each of the liquid accommodating tanks 121. The airflow generating device 123 is configured to generate at least one airflow F to flow the atomized liquid W2 to between the door frame 110 and the lane A thereby forming the mist curtain S. The atomizing module 190 of the present embodiment is disposed in the main body 111, for example.

[0033] The liquid accommodating tank 121 is for accommodating the

liquid W1, and the liquid W1 is, for example, water, but the present invention is not limited thereto. The liquid accommodating tank 121 is, for example, a conical body, and includes at least one flow path 1211 (FIG. 2 is exemplified by one flow path 1211) therein. The flow path 1211 penetrates the liquid accommodating tank 121 and communicates with the at least one mist outlet 1111 (FIG. 2 is exemplified by one mist outlet 1111) of the main body 111. However, the specific shape and position of the liquid accommodating tank 121 and its flow path 1211 are not limited to those shown in FIG. 2.

[0034] The atomizer 122 is disposed in the liquid accommodating tank 121. Specifically, the atomizer 122 may be located, for example, inside the liquid accommodating tank 121 and at a position sink in the liquid W1, but the present invention is not limited to that shown in FIG. 2. The atomizer 122 is configured to atomize the liquid W1 in the liquid accommodating tank 121 to form the atomized liquid W2, and the atomized liquid W2 floats on the surface of the liquid W1 to enter into the flow path 1211. In addition, the mist provided by the atomizer 122 is, for example, slightly larger than 2.5 liters/hour, but the present invention is not limited to the above parameter range. In addition, the atomizer 122 is, for example, an ultrasonic atomizer or a high-pressure sprayer, however, the present invention does not limit the type of the atomizer 122. The particle diameter of the mist particle in the atomized liquid W2 is, for example, about 1 to 5 micrometers (um), so as to have a good light-diffusing effect to enhance the effect of projection, but the particle diameter is not limited to the above numerical range.

[0035] The airflow generating device 123 is, for example, a fan configured to form the airflow F. The fan is, for example, an axial flow

fan or a centrifugal fan, and the present invention does not limit the type of the fan. The airflow generating device 123 is disposed beside the liquid accommodating tank 121 and is configured to generate the airflow F , allowing atomized liquid W2 to flow from the mist outlet 1111 to the space between the door frame 110 and the lane A, thereby forming the mist curtain S. In the present embodiment, the number of the airflow generating devices 123 is, for example, two, so the mist curtain S is located between the two flows of air F to prevent the atomized liquid W2 from escaping, thereby improving the stability of the mist curtain S; but the present invention does not limit the specific number and location of the airflow generating device 123. In addition, the flow range of the airflow F is, for example, 2.5 to 8.0 m³/min, but the present invention is not limited to the above parameter range.

[0036] The atomizing module 190 of the present embodiment may include a liquid level sensor 124 disposed in the liquid accommodating tank 121. The liquid level sensor 124 is configured to sense the liquid level of the liquid accommodating tank 121. In addition, the mist curtain generating device 120 further includes a liquid replenishing module 125 electrically connected to the liquid level sensor 124 and connected to the liquid accommodating tank 121. The liquid replenishing module 125 may replenish the liquid accommodating tank 121 with the liquid W1 when the liquid level sensor 124 senses that the liquid level is insufficient. In addition, the mist curtain generating device 120 further includes an indicating light 126 which is disposed on the door frame 110 and electrically connected to the liquid level sensor 124. The indicating light 126 is configured to display information about the liquid level of the liquid accommodating tank 121.

[0037] FIG. 3 is a schematic view of a liquid replenishing module in accordance with an embodiment of the present invention. As shown in FIG. 3, the liquid replenishing module 125 of the present embodiment includes, for example, at least one liquid recovery machine 1251, a recovery pipe line 1252 and a water extraction motor 1253. The liquid recovery machine 1251 is disposed in at least one of the support columns 112 and configured to recover the atomized liquid W2 of the mist curtain S. The recovery pipe line 1252 is connected between the liquid recovery machine 1251 and the liquid accommodating tank 121. The water extraction motor 1253 is disposed to the recovery pipe line 1252 and electrically connected to the liquid level sensor 124. The water extraction motor 1253 is configured to feed the liquid W1 which is recovered by the liquid recovery machine 1251 into the liquid accommodating tank 121. The liquid recovery machine 1251 is, for example, a dehumidifier; therefore, in addition to recovering the atomized liquid W2, the dehumidifier may also extract water from environment. The liquid replenishing module 125 of the present embodiment is, for example, disposed in the support column 112, and each of the support columns 112 may be disposed with one or more liquid replenishing modules 125. The number of the liquid recovery machines 1251 of each liquid replenishing module 125 may be one or plural.

[0038] Please refer to FIG. 1 again. The gate of parking lot 100 of the present embodiment further includes a sensing device 140 and a ticket card device 150. The sensing device 140 is located on the lane A and in front of the entrance of the gate of parking lot 100. The sensing device 140 is configured to sense the position of a vehicle. The ticket card device 150 is electrically connected to the mist curtain generating device

120, the projection device 130 and the sensing device 140. The ticket card device 150 is configured to provide the driver of a vehicle to take out or put in a ticket card (not shown). In one embodiment, the ticket card device 150, the mist curtain generating device 120, the projection device 130 and the sensing device 140 disposed on the ground may be electrically connected to the control device 170, which controls the mist curtain generating device 120 and the projection device 130 to actuate. For example, when a vehicle is sensed by the sensing device 140, a stop sign may be displayed by the image picture I on the mist curtain S; and when the driver of the vehicle takes out a ticket card from the ticket card device 150 (which may be disposed at the entrance of the parking lot) or puts a ticket card in the ticket card device 150 (which may be disposed at the exit of the parking lot), the image picture I on the mist curtain S is switched to a pass sign and the driver is noted to drive into the parking lot. Because the gate of parking lot 100 has the function of access control and the vehicle driver can see through the mist curtain S, the driver can control the vehicle to assuredly pass through the mist curtain S, thereby effectively solving the problems caused by the conventional lifting fence. In addition, since the gate of parking lot 100 can display the image picture I on the mist curtain S to provide the vehicle driver with variable information, the problem that the conventional parking lot can only provide limited information is solved. The ticket card device 150 and the sensing device 140 are for illustrative purposes only, and other means may be used to achieve similar functionality.

[0039] The gate of parking lot 100 of the present embodiment further includes, for example, at least one detecting device 160 (FIG. 1 is exemplified by a plurality of detecting devices 160). The detecting

device 160 is disposed above the lane A. Specifically, the detecting device 160 may be disposed on the door frame 110 or on the projection device 130; or, the detecting device 160 may be disposed at any position above the lane A according to the requirements. The detecting device 160 may be configured to detect a vehicle, such as detecting a distance between the vehicle and the door frame 110 or the plate number of the vehicle or identifying an identification element (e.g., a radio frequency identification element) on the vehicle. The control device 170 is electrically connected to the detecting device 160, the mist curtain generating device 120 and the projection device 130. The control device 170 is configured to, according to the detection result of the detecting device 160, control the projection device 130 and the mist curtain generating device 120, such as controlling the projection device 130 to adjust the intensity of the image beam L and the content of the displayed information, and controlling the mist curtain generating device 120 to adjust the mist of the mist curtain S. The detecting device 160 may include an ultrasonic detecting device, an optical detecting device, an image capturing device, a radio frequency identification detecting device, etc; however, the present invention does not limit the number and type of the detecting device 160. The aforementioned optical detecting device is, for example, an infrared ray detecting device or a laser detecting device. The aforementioned radio frequency identification detecting device can be used to read the radio frequency identification element on the vehicle, so that the parking fee can be registered or paid. The aforementioned image capturing device can detect the plate of the vehicle by combining the optical character recognition (OCR) technique.

[0040] FIG. 4 is a schematic view of a liquid replenishing module in

accordance with another embodiment of the present invention. Please refer to FIGs. 2 and 4 together. The liquid replenishing module 125a of the present embodiment includes a liquid supply pipe line 1254 and a valve member 1255. The liquid supply pipe line 1254 is connected between a liquid source 180 (e.g., a liquid storage tank) and the liquid accommodating tank 121. The valve member 1255 is disposed to the liquid supply pipe line 1254 and electrically connected to the liquid level sensor 124. The valve member 1255 is, for example, an electromagnetic valve, and the present invention does not limit the type of the valve member 1255. When the liquid level sensor 124 senses that the liquid level of the liquid accommodating tank 121 is insufficient, the valve member 1255 is opened to supply the liquid accommodating tank 121 with the liquid from the liquid source 180. The liquid replenishing module 125a may be used in place of the liquid replenishing module 125 in FIG. 3. In addition, the liquid replenishing module 125a may be integrated with the liquid replenishing module 125 in FIG. 3; that is, in addition to including the liquid recovery machine 1251, the recovery pipe line 1252 and the water extraction motor 1253, the integrated liquid replenishing module may also include the liquid supply pipe line 1254 connected to the liquid source 180 and the valve member 1255, so that liquid can be replenished via the liquid supply pipe line 1254 when the liquid recovery amount is insufficient.

[0041] FIG. 5 is a schematic view of a gate of parking lot in accordance with another embodiment of the present invention. As shown in FIG. 5, the gate of parking lot 100b of the present embodiment is similar to the gate of parking lot 100 of the above embodiment except that the atomizing module 190 in FIG. 3 is disposed in the main body 111 but the

atomizing module 190a of the mist curtain generating device 120a of the present embodiment is disposed in at least one of the support columns 112. Each atomizing module 190a further includes at least one atomized liquid tube 191 connected between the liquid accommodating tank 121a in the respective atomizing module 190a and the main body 111a to guide the atomized liquid W2 to flow to the main body 111a; however, the specific shape of the atomizing module 190a is not limited to that shown in FIG. 5. The detailed structure of the main body 111a will be described below.

[0042] FIG. 6 is a schematic view of the main body of the door frame of the gate of parking lot of FIG. 5 in accordance with an embodiment of the present invention. Please refer to FIGs. 5 and 6 together. The main body 111a of the door frame 110 has a guide structure 113 therein. The guide structure 113 has at least one mist inlet 1112, at least one mist outlet 1111a and at least one flow path 1211a communicating with the mist inlet 1112 and the mist outlet 1111a. The atomized liquid tube 191 passes through the mist inlet 1112 to supply the flow path 1211a with the atomized liquid W2, and the atomized liquid W2 is then discharged from the mist outlet 1111a. Further, at least one airflow generating device 123a is further included in the main body 111a and is disposed on a side of the flow path 1211a. The airflow generating device 123a is configured to generate at least one flow of air F to allow the atomized liquid W2 to flow from the mist outlet 1111a to the space between the door frame 110 and the lane A, thereby forming the mist curtain S. The main body 111a and the airflow generating device 123a of the present embodiment are not limited to those shown in FIG. 6. In addition, the present embodiment may be combined with the components in the above embodiment (for example, the atomizer 122), and no redundant detail is to be given herein.

Therefore, the present embodiment can effectively reduce the weight load of the main body 111a by moving the atomizing module 190a to the support column 112.

[0043] In another embodiment, the support column 112 may be disposed with a mist outlet hole (not shown), and the atomized liquid W2 generated by the atomizing module 190a may also be discharged from the mist outlet hole of the support column 112 without being guided to the main body 111a. In this case, the airflow generating device (not shown) may also be disposed in the support column 112.

[0044] FIG. 7 is a schematic view of a parking space with display function in accordance with an embodiment of the present invention. As shown in FIG. 7, the parking space 200 with display function of the present embodiment includes a parking grid G, a mist curtain generating device 120b and a projection device 130. The mist curtain generating device 120b is fixed above the parking grid G, thereby forming the mist curtain S between the mist curtain generating device 120b and the parking grid G. The projecting device 130 provides the image light L to form the image picture I. The mist curtain generating device 120b is fixed to an adjacent wall (not shown) by, for example, at least one hanging member 210, but the present invention does not limit the fixing manner of the mist curtain generating device 120b.

[0045] The mist curtain generating device 120b is similar to the mist curtain generating device 120 in FIG. 2, and the mist curtain generating device 120b also includes a liquid accommodating tank, at least one atomizer and an airflow generating device. The liquid accommodating tank is for accommodating a liquid. The atomizer is disposed in the liquid accommodating tank and configured to atomize the liquid in the

liquid accommodating tank to form an atomized liquid. The airflow generating device is disposed beside the liquid accommodating tank and configured to generate at least one flow of air to allow the atomized liquid flow to the space between the mist curtain generating device 120b and the parking grid G, thereby forming the mist curtain S. Please refer to the above embodiments for the detailed descriptions about the liquid accommodating tank, the atomizer and the airflow generating device, and no redundant detail is to be given herein. The mist curtain generating device 120b may further include, for example, at least one liquid level sensor and a liquid replenishing module. The liquid level sensor of the present embodiment is similar to the liquid level sensor 124 in FIG. 2. The liquid replenishing module of the present embodiment is similar to the liquid replenishing module 125a in FIG. 4. The liquid replenishing module further includes a liquid supply pipe line and a valve member to provide the atomizer with the liquid in an external liquid source of the mist curtain generating device 120b. Please refer to the above embodiments for the detailed descriptions about the liquid level sensor and the liquid replenishing module (including the liquid supply pipe line and the valve member), and no redundant detail is given herein. In addition, in the present embodiment, the indicating light 126 may be disposed on the mist curtain generating device 120b or the projection device 130 to display information about the height of the liquid level of the liquid accommodating tank. Further, the indicating light 126 may be electrically connected to the control device in the mist curtain generating device 120b to display corresponding information in response to that the control device determines whether there is a vehicle in the parking grid G according to the detecting result of the detecting device 160. The

specific positions of the indicating light 126, the detecting device 160 and the control device are not limited in the present embodiment. Please refer to the above embodiments for the detailed descriptions about the indicating light 126, the detecting device 160 and the control device, and no redundant detail is to be given herein.

[0046] The parking space 200 with display function of the present embodiment can display various kinds of information on the mist curtain S of the parking grid G depending on design requirements. The parking space 200 with display function may be disposed in one of a plurality of parking grids G (FIG. 7 is exemplified by one parking space 200 with display function). In other embodiments, the parking space 200 with display function may be disposed in each one of the parking grids G. In addition, the parking space 200 with display function of the present embodiment may further include the detecting device 160 located above the parking grid G. Specifically, the detecting device 160 may be disposed on the mist curtain generating device 120b or on the projection device 130; or, the detecting device 160 may be disposed at any position above the parking grid G according to the requirements. The control device may control the projection device 130 to display the image picture I with corresponding information (e.g., parking allowed or no parking) on the mist curtain S according to whether there is a vehicle in the parking grid G based on the detection of the detecting device 160, thereby reminding the driver seeking the parking grid G. Further, the image picture I may display different information as described in the above embodiment (e.g., parking information or advertising information).

[0047] In summary, the present invention provides a gate of parking lot, in which a mist curtain is formed between a door frame and a lane of

the parking lot, an image beam is projected on the mist curtain by a projection device, so that an image picture with stop or pass sign is displayed on the mist curtain; therefore, the gate of parking lot of the present invention has the function of access control. Meanwhile, because the vehicle driver can see through the mist curtain, the driver can safely pass through the mist curtain, thereby effectively solving the problems caused by the conventional lifting fence. In addition, since the gate of parking lot can display the image picture on the mist curtain to provide the vehicle driver with variable information, the problem that the conventional parking lot can only provide limited information is improved. In addition, the present invention further provides a parking space with display function, in which a mist curtain generating device is fixed above a parking grid, a mist curtain is formed between the mist curtain generating device and the parking grid, an image beam is projected on the mist curtain by a projection device, so that an image picture is displayed on the mist curtain. The image picture can be a variety of information, depending on the design requirements.

[0048] While the invention has been described in terms of what is presently considered to be the most practical and preferred embodiments, it is understood that the invention needs not be limited to the disclosed embodiment. On the contrary, it is intended to cover various modifications and similar arrangements included within the spirit and scope of the appended claims which are to be accorded with the broadest interpretation so as to encompass all such modifications and similar structures.

WHAT IS CLAIMED IS:

1. A gate of parking lot applied to a parking lot, and the gate of parking lot comprising:

- a door frame, disposed in a lane of the parking lot;
- a mist curtain generating device, disposed in the door frame and configured to form a mist curtain between the door frame and the lane; and
- a projection device, configured to provide an image beam to the mist curtain to form an image picture on the mist curtain.

2. The gate of parking lot according to claim 1, wherein the door frame comprises:

- a main body, opposite to the lane; and
- a plurality of support columns, standing on the lane and configured to support the main body.

3. The gate of parking lot according to claim 2, wherein the mist curtain generating device comprises:

- at least one atomizing module, disposed in the door frame, and each atomizing module comprising:

- a liquid accommodating tank, configured to accommodate a liquid; and

- at least one atomizer, disposed in the liquid accommodating tank and configured to atomize the liquid in the liquid accommodating tank to form an atomized liquid; and

- at least one airflow generating device, disposed in the door frame and configured to generate at least one flow of air to allow the atomized liquid to flow in the space between the door frame and the lane, thereby

forming the mist curtain.

4. The gate of parking lot according to claim 3, wherein each of the atomizing modules further comprises a liquid level sensor, the liquid level sensor is disposed in the liquid accommodating tank and configured to sense a liquid level of the liquid accommodating tank, and the mist curtain generating device further comprises a liquid replenishing module electrically connected to the liquid level sensor and connected to the liquid accommodating tank.

5. The gate of parking lot according to claim 4, wherein the mist curtain generating device further comprises at least one indicating light disposed on the door frame and electrically connected to the liquid level sensor.

6. The gate of parking lot according to claim 4, wherein the liquid replenishing module comprises:

- at least one liquid recovery machine, disposed in at least one of the support columns and configured to recover the atomized liquid of the mist curtain;

- a recovery pipe line, connected between the at least one liquid recovery machine and the liquid accommodating tank; and

- a water extraction motor, disposed to the recovery pipe line and electrically connected to the liquid level sensor, wherein the water extraction motor is configured to feed the liquid recovered by the liquid recovery device to the liquid accommodating tank.

7. The gate of parking lot according to claim 6, wherein the liquid

replenishing module further comprises:

- a liquid supply pipe line, connected between a liquid source and the liquid accommodating tank; and

- a valve member, disposed to the liquid supply pipe line and electrically connected to the liquid level sensor.

8. The gate of parking lot according to claim 4, wherein the liquid replenishing module comprises:

- a liquid supply pipe line, connected between a liquid source and the liquid accommodating tank; and

- a valve member, disposed to the liquid supply pipe line and electrically connected to the liquid level sensor.

9. The gate of parking lot according to claim 4, wherein the at least one atomizing module is disposed in the main body, and the airflow generating device is disposed beside the liquid accommodating tank.

10. The gate of parking lot according to claim 4, wherein the at least one atomizing module is disposed in at least one of the support columns, and each of the atomizing modules further comprises at least one atomized liquid tube connected between the liquid accommodating tank and the main body to guide the atomized liquid to the main body.

11. The gate of parking lot according to claim 1, further comprising:

- a detecting device, disposed above the lane and configured to detect a vehicle; and

- a control device, disposed in the door frame and electrically

connected to the detecting device, the mist curtain generating device and the projection device, wherein the control device is configured to control the projection device and the mist curtain generating device based on a detection result of the detecting device.

12. A parking space with display function, comprising:

- a parking grid;

- a mist curtain generating device, fixed above the parking grid and configured to form a mist curtain between the mist curtain generating device and the parking grid; and

- a projection device, configured to provide an image beam to the mist curtain to form an image picture on the mist curtain.

13. The parking space with display function according to claim 12, wherein the mist curtain generating device comprises:

- a liquid accommodating tank, configured to accommodate a liquid;

- a atomizer, disposed in the liquid accommodating tank and configured to atomize the liquid in the liquid accommodating tank to form an atomized liquid; and

- an airflow generating device, disposed beside the liquid accommodating tank and configured to generate at least one flow of air to allow the atomized liquid to flow in the space between the mist curtain generating device and the parking grid, thereby forming the mist curtain.

14. The parking space with display function according to claim 13, wherein the mist curtain generating device further comprises:

- a liquid level sensor, disposed in the liquid accommodating tank and

configured to sense a height of a liquid level of the liquid accommodating tank; and

a liquid replenishing module, electrically connected to the liquid level sensor and connected to the liquid accommodating tank.

15. The parking space with display function according to claim 14, wherein the liquid replenishing module comprises:

a liquid supply pipe line, connected between a liquid source and the liquid accommodating tank; and

a valve member, disposed to the liquid supply pipe line and electrically connected to the liquid level sensor.

16. The parking space with display function according to claim 13, further comprising a detecting device disposed above the parking grid.