INTELLIGENT TRANSMISSION MECHANISM AND BORDER CONTROL EGATE

TECHNICAL FIELD

The present disclosure relates generally to a border control eGate field, and more particularly relates to an intelligent transmission mechanism and a border control eGate.

BACKGROUND

The eGate is kind of channel management device used to manage the stream of people and regulate their entrance and exit. Its most foundational and core function is to allow one person to pass through at one time. Accordingly, it can be used at the passage ports of various occasions such as the airport, border inspection, and station and so on.

At present, the integrated management of the eGate comprises the centralized surveillance and management carried out through the backend management system, and the current channel management carried out at the eGate end, such as the exception handling and working mode switching of the channel. When implementing the management at the eGate end, the previous way is to operate on the embedded touch screen, and such operation can only be effective for the current channel. If there are multiple channels operate abnormally, they must be processed one channel by one, which is more cumbersome. In additional, the touch screen can also be seen by non-staff, so the security is low.

Therefore, how to integrate the management terminal with the eGate and ensure the safety of the management terminal is a technical problem that needs to be solved urgently.

SUMMARY

The object of the present application is to provide an intelligent transmission mechanism and a border control eGate, aiming at the technical problem in the prior art that how to integrate the management terminal with the eGate and ensure the safety of the management terminal.

In a first aspect, an intelligent transmission mechanism is provided, which is arranged at one end of a border control eGate. A management terminal communicating with the border control eGate is connected with the intelligent transmission mechanism. The intelligent transmission mechanism comprises a control panel, an installation frame, an installation platform, a drive

device and a protective door; wherein the installation frame is provided with an accommodation cavity and an opening, at least one protective door is provided and articulated at the opening, the control panel is in a control connection with the drive device, the installation platform is arranged in the accommodation cavity and driven by the drive device to move up and down in the accommodation cavity; the installation platform has an accommodation position and a transmission position in the accommodation cavity, the management terminal is accommodated in the accommodation cavity when the installation platform is located at the accommodation position and is extended from the opening to outside when the installation platform is located at the transmission position; each protective door is linked with the installation platform and has a closed state of covering the opening together when the installation platform is located at the accommodation position and an opening state of rotating away from the opening together when the installation platform is located at the transmission position.

Preferably, the installation platform comprises a base provided with a main base body and a U-shaped enclosure wall with a positioning space; wherein the main base body is placed horizontally in the accommodation cavity, the U-shaped enclosure wall is located on an upper side of the main base body while an end of the management terminal is inserted and positioned in the positioning space.

Furthermore, the drive device comprises a power source and a screw rod butted with a power output shaft of the power source and rotated synchronously, the screw rod is extended between the accommodation position and the transmission position, the main base body is threaded with the screw rod, and the main base body is position-limited in the accommodation cavity along a circumferential direction.

Preferably, the installation platform further comprises a transmission frame with multi-freedom degree, one end of which is rotatablely connected to the upper side of the main base body, and other end of which is detachably connected with the management terminal; wherein the transmission frame comprises an extension state of transmitting the management terminal to a designated position when applying a certain pull force to the transmission frame, and a retraction state of retracting the management terminal to the U-shaped enclosure wall when applying a certain external force to the transmission frame.

Preferably, the installation platform further comprises a clamping frame fixedly connected with the management terminal, a free end of the transmission frame is detachably connected with the clamping frame.

Specifically, the clamping frame further comprises a main frame body fixedly connected with the management terminal, and a clamping structure connected with the main frame body; wherein the main frame body is provided with a clamping groove, the free end of the transmission frame is inserted into the clamping groove and position-limited in the clamping groove through the clamping structure.

Specifically, the clamping structure comprises two elastic clamping assemblies, the main frame body is provided with an accommodation groove on two opposite groove walls of the clamping groove, one end of each elastic clamping assembly is connected in one accommodation groove, other end of each elastic clamping assembly can be elastically retracted to the accommodation groove under an external force action, and elastically extended into the clamping groove without the external force action.

Specifically, each elastic clamping assembly comprises an elastic piece and a clamping block, the elastic piece is arranged in the accommodation groove , one end of the elastic piece is connected with the main frame body while other end of the elastic piece is connected with one end of the clamping block, other end of the clamping block is extended into the clamping groove under an elastic force of the elastic piece, an inclined guide plane is arranged at an end of the clamping block contacting the free end of the transmission frame, and the inclined guide plane is extended towards an insertion direction of the free end.

Specifically, a position limitation groove is arranged on a surrounding side of the clamping groove, wherein the position limitation groove is communicated with the clamping groove, the free end of the transmission frame is inserted into the clamping groove and stuck at a groove bottom of the position limitation groove.

Furthermore, the intelligent transmission mechanism further comprises a linkage assembly and a transmission assembly corresponding to the protective door one by one;

wherein the installation frame further comprises a position limitation plate corresponding to the protective door one by one and a body provided with the accommodation cavity and the opening; each of the position limitation plate is connected with a cavity wall of the accommodation cavity for dividing the accommodation cavity into a main cavity for sliding the

installation platform up and down and a secondary cavity for sliding the transmission assembly up and down, an upper end of the transmission assembly is articulated with the protective door, and a lower end of the transmission assembly is connected with the installation platform through the linkage assembly, wherein the protective door is accommodated in the secondary cavity during the opening state.

Furthermore, the linkage assembly comprises an adapting wheel fixed on the cavity wall of the accommodation cavity, and a connection piece sleeved on the adapting wheel, wherein one end of the connection piece is fixed to the installation platform and other end of the connection piece is fixed to the transmission assembly.

Preferably, the transmission assembly comprises at least one roller and a guide structure penetrating through the secondary cavity with its upper end articulated with the protective door and lower end connected with the linkage assembly; each roller is fixed on a lower side of the protective door and located at an articulated end of the protective door; the position limitation plate corresponding to the transmission assembly is arranged with a guide plate protruded at its upper end and corresponding to each roller one by one; each guide plate is arranged upward and extended towards the main cavity obliquely, the roller can collide with the guide plate and roll on the guide plate when the protective door is opened or closed.

Furthermore, the guide structure comprises a transmission piece and a guide block provided with a guide channel penetrating through the guide block perpendicularly and fixed on a cavity wall of the accommodation cavity or the secondary cavity; wherein the transmission piece is penetrating through the guide channel and the secondary cavity, wherein an upper end of the transmission piece is connected with the protective door through an articulated piece with an elastic recovery force, a lower end of the transmission piece is connected with the linkage assembly.

Preferably, the transmission assembly further comprises an elastic reset piece, one end of which is fixed to the body of the installation frame, other end of which is connected with the transmission piece, the reset piece has an elastic recovery force F1 when the protective door is in the closed state while has an elastic recovery force F2 when the protective door is in the open state and F2 > F1; wherein the protective door is automatically closed by an action of the elastic recovery force F2 after removing a drive control of the drive device.

Preferably, the intelligent transmission mechanism further comprises a charging structure electrically connected to the control panel, the charging structure is fixed in the accommodation cavity, and the main base body is provided with a charging port opposite to a charging port of the management terminal, wherein the management terminal is accommodated in the accommodation cavity and charged by docking with the charging structure through the charging port when the installation platform is in the accommodation position.

In a second aspect, a border control eGate is provided, which comprises a main body, a management terminal and an intelligent transmission mechanism as described above arranged at one end of the main body, wherein the management terminal is detachably arranged on the intelligent transmission mechanism.

The intelligent transmission mechanism and border control eGate according to the present disclosure have following technical effects. The intelligent transmission mechanism comprises a control panel, an installation frame, an installation platform, a drive device and a protective door; wherein the installation frame is provided with an accommodation cavity and an opening, at least one protective door is provided and articulated at the opening, the control panel is in a control connection with the drive device, the installation platform is arranged in the accommodation cavity and driven by the drive device to move up and down in the accommodation cavity; the installation platform has an accommodation position and a transmission position in the accommodation cavity, the management terminal is accommodated in the accommodation cavity when the installation platform is located at the accommodation position and is extended from the opening to outside thus being accessible and operable by the staff when the installation platform is located at the transmission position. Each protective door is linked with the installation platform and has a closed state of covering the opening together when the installation platform is located at the accommodation position, thus preventing the non-staff from contacting the management terminal and playing a protective role, and has an opening state of rotating away from the opening together when the installation platform is located at the transmission position. In this way, not only the management terminal and the border control eGate are perfectly integrated, but also the safety of the management terminal can be better ensured by automatically opening the protective door when the management terminal should be accessible and automatically closing the protective door when the management terminal should be accommodated through the linkage arrangement structure of the protective door. The whole

structure is simple and intelligent, which greatly improves the management convenience of the eGate.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to more clearly illustrate the technical solution in the embodiment of the present disclosure, the drawings used in the embodiments or prior arts will be briefly introduced. It is obvious that the drawings in the following description are only some embodiments of the present application. For ordinary technicians in the present art, they can also obtain other drawings without paying creative labor according to these drawings.

Fig. 1 is a first stereogram of the intelligent transmission mechanism provided by the present application.

Fig. 2 is a second stereogram of the intelligent transmission mechanism provided by the present application.

Fig. 3 is a stereogram of the installation frame provided by the present application.

Fig. 4 is a sectional view along the A-A line in Fig. 1.

Fig. 5 is a stereogram of the installation platform provided by the present application.

Fig. 6 is a stereo exploded diagram of the installation platform provided by the present application.

Fig. 7 is a stereo exploded diagram of the clamping frame provided by the present application.

Fig. 8 is a stereo assembly diagram of the protective door and the transmission assembly provided by the embodiment of the present application.

Reference number list

Intelligent transmission mechanism	1	Installation frame	100
Installation platform	200	Protective door	300
Drive device	400	Accommodation cavity	101
Opening	102	Accommodation position	103
Transmission position	104	Support foot	130
Base	210	Main base body	211

U-shaped enclosure wall	212	Positioning space	201
Charging port	202	Power source	410
Screw rod	420	Lower sensor	700
Transmission frame	220	Support base	221
First adapting arm	222	Second adapting arm	223
Extension arm	224	Adaptor	225
Clamping piece	226	Spherical portion	2261
Connection portion	2262	Clamping portion	2263
Spherical groove	2201	Clamping frame	230
Main frame body	231	Clamping structure	232
Clamping groove	2301	Elastic clamping assembly	2321
Accommodation groove	2302	Elastic piece	23211
Clamping block	23212	Inclined guide plane	2303
Position limitation groove	2304	Slide joint groove	2305
Slide joint platform	23213	Position limitation boss	233
Groove	2306	Handle protrusion	23214
Linkage assembly	500	Transmission assembly	600
Body	110	Position limitation plate	120
Main cavity	1011	Secondary cavity	1012
Adapting wheel	510	Roller	610
Guide structure	620	Guide plate	121
Transmission piece	621	Guide block	622
Transmission rod	6211	Lower end piece	6212
Upper end piece	6213		

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In order to make the object, technical scheme and advantages of the present application more clear, the present application will be further described in detail in combination with the drawings and the embodiments. It should be understood that the specific embodiments described

herein are only used to explain the present application and are not used to limit the present application.

It should be noted that when an piece/assembly is mentioned as being "fixed" or "arranged" on another piece/assembly, it can be directly on another piece/assembly or it may be indirectly fixed or arranged on another piece/assembly through a third piece/assembly. When an piece/assembly is mentioned as being "connected" with another piece/assembly, it may be directly connected with another piece/assembly or it may be indirectly connected to another piece/assembly through a third assembly.

It should be noted that the technical terms, such as “length”, “width”, “upper”, “lower”, “front”, “back”, “left”, “right”, “vertical”, “horizontal”, “top”, “bottom”, “inner”, “outer”, indicating the orientation or position relationship are based on the orientation or position relationship shown in the attached drawings. They are just for the description convenience and simplifying, rather than indicating or implying that the device or piece referred to must have the specific orientation, or be constructed and operated in the specific orientation, and cannot be understood as the limitation of the present application.

In addition, the terms "first" and "second" are used for descriptive purposes only and cannot be understood as indicating or implying the relative importance or implicitly indicating the number of technical features. Thus, the features defined with "first" and "second" can explicitly or implicitly include one or more of these features. In the description of the present application, “a plurality of” means two or more, unless otherwise is specifically defined.

Referring Figs.1-4 simultaneously, the embodiment of the present application has provided an intelligent transmission mechanism 1 arranged at one end of a border control eGate. A management terminal communicating with the border control eGate is connected with the intelligent transmission mechanism 1. The intelligent transmission mechanism 1 comprises a control panel (unshown), an installation frame 100, an installation platform 200, a drive device 400 and a protective door 300. The installation frame 100 is provided with an accommodation cavity 101 and an opening 102. At least one protective door 300 is provided. The protective door 300 is articulated at the opening 102. The control panel is in a control connection with the drive device 400. The installation platform 200 is arranged in the accommodation cavity 101 and driven by the drive device 400 to move up and down in the accommodation cavity 101. The installation platform 200 has an accommodation position 103 and a transmission position 104 in

the accommodation cavity 101. The management terminal is accommodated in the accommodation cavity 101 when the installation platform 200 is located at the accommodation position 103 (referring Fig.2) and is extended from the opening 102 to the outside when the installation platform 200 is located at the transmission position 104 (referring Fig.1). Each protective door 300 is linked with the installation platform 200. Each protective door 300 has a closed state of covering the opening 102 together when the installation platform 200 is located at the accommodation position 103 (referring Fig.2) and an opening state of rotating away from the opening 102 together when the installation platform 200 is located at the transmission position 104 (referring Fig.1).

In the present embodiment, the intelligent transmission mechanism 1 comprises a control panel, an installation frame 100, an installation platform 200, a drive device 400 and a protective door 300. The installation frame 100 is provided with an accommodation cavity 101 and an opening 102. At least one protective door 300 is provided and articulated at the opening 102. The control panel is in a control connection with the drive device 400, the installation platform 200 is arranged in the accommodation cavity 101 and driven by the drive device to move up and down in the accommodation cavity 101. The installation platform 200 has an accommodation position 103 and a transmission position 104 in the accommodation cavity 101. The management terminal is accommodated in the accommodation cavity 101 when the installation platform 200 is located at the accommodation position 103 and is extended from the opening 102 to outside thus being accessible and operable by the staff when the installation platform 200 is located at the transmission position 104. Each of the at least one protective doors 300 is linked with the installation platform 200 and has a closed state of covering the opening 102 together when the installation platform 200 is located at the accommodation position 103, thus preventing the non-staff from contacting the management terminal for playing a protective role. In additional, each of the at least one protective doors 300 further has an opening state of rotating away from the opening 102 together when the installation platform 200 is located at the transmission position 104. In this way, not only the management terminal and the border control eGate are perfectly integrated, but also the safety of the management terminal can be better ensured by automatically opening the protective door 300 when the management terminal should be accessible and automatically closing the protective door 300 when the management terminal should be accommodated through the linkage arrangement structure of the protective door 300.

The whole structure is simple and intelligent, which greatly improves the management convenience of the eGate.

In the present embodiment, the intelligent transmission mechanism 1 further comprises a control switch in control connection with the control panel. The control switch is arranged at one end of the eGate and is managed closely through a locked door. When the staff needs to acquire the management terminal, he/she opens the door by the key, presses the control switch and controls the drive device 400 through the control panel for implementing the above mentioned series of initiation actions. Then the control switch is pressed again, the control panel controls the drive device 400 to implement the above accommodation actions. This facilitates the operation of the staff.

In the present embodiment, the intelligent transmission mechanism 1 further comprises an upper sensor (unshown) and a lower sensor 700, which are respectively fixed on the cavity wall of the accommodation cavity 101. The location of the upper sensor is the transmission position 104, while the location of the lower sensor 700 is the accommodation position 103. The upper sensor and lower sensor 700 are used for detecting the sliding position of the installation platform 200. They are communicated with the control panel for sending the location signal of the installation platform 200 to the control panel.

In the present embodiment, a plurality of support feet 130 of the installation frame 100 have extended from the opening 102 outwardly and facing each other. Each protective door 300 respectively collides with at least one support foot 130 which plays the role of supporting the protective door 300.

In the present embodiment, there are two protective doors 300 which are relatively opened and closed. Of course, more or less protective doors 300 can be arranged.

Referring Figs. 4-6 simultaneously, the installation platform 200 comprises a base 210 provided with a main base body 211 and a U-shaped enclosure wall 212 with a positioning space 201. The main base body 211 is placed horizontally in the accommodation cavity 101, the U-shaped enclosure wall 212 is located on an upper side of the main base body 211 while an end of the management terminal is inserted and positioned in the positioning space 201. In this way, when the staff wants to accommodate the management terminal into the eGate, he/she just needs to insert the bottom end of the management terminal into the positioning space 201, then the management terminal can be positioned accurately. Then the accommodation process can be

initiated to insure that the management terminal would not touch other assemblies when it is accommodated downwardly, thus improving the reliability of the overall operation.

In the present embodiment, the main base body 211 is connected to the cavity wall of the accommodation cavity 101 through at least one group of slide rail assemblies comprising a slide rail and a slide block clamped on the slide rail and slideable along the length direction of the slide rail. The slide rail is extended along the longitudinal direction and fixed on the cavity wall of the accommodation cavity 101. The slide block is fixed on the main base body 211 to realize a directional movement in the longitudinal direction of the main base body 211 in the accommodation cavity 101.

The base 210 further comprises a detection element for detecting whether the management terminal is retracted into the positioning space 201 when the management terminal is in a retraction state. The detection element is arranged in the positioning space 201 and communicated with the control panel. In this way, the automatic detection about whether the management terminal is retracted in place is realized, and no human intervention is needed, which effectively improves the accommodation efficiency of the management terminal.

Preferably, the intelligent transmission mechanism 1 further comprises a charging structure (unshown) electrically connected to the control panel. The charging structure is fixed in the accommodation cavity 101, and the main base body 211 is provided with a charging port 202 opposite to a charging port of the management terminal. The management terminal is accommodated in the accommodation cavity 101 and charged by docking with the charging structure through the charging port 202 when the installation platform 200 is in the accommodation position 103. In this way, the management terminal can be charged automatically by timely replenishing the electrical power for the management terminal, ensuring that the management terminal always has power or is full of power, thus further improving the intellectualization of the intelligent transmission mechanism 1.

Preferably, the drive device 400 comprises a power source 410 and a screw rod 420 butted with a power output shaft of the power source 410 and rotated synchronously. The screw rod 420 is extended between the accommodation position 103 and the transmission position 104. The main base body 211 is threaded with the screw rod 420. The main base body 211 is position-limited in the accommodation cavity 101 along a circumferential direction. Through the directional rotation of the screw rod 420, the main base body 211 can be driven to move along

the extension direction of the screw rod 420. In this embodiment, the drive device 400 further comprises a nut (unshown). The main base body 211 is provided with an installation hole penetrating through itself perpendicularly. The nut is embedded in the installation hole and threaded with the screw rod 420 to improve the connection stability while softening the material selection conditions for the main base body 211.

In this embodiment, the power source 410 is a drive motor.

Referring Figs 4-6 simultaneously, preferably, the installation platform 200 further comprises a transmission frame 220 with multi-freedom degree, one end of which is rotatablely connected to the upper side of the main base body 211, and the other end of which is detachably connected with the management terminal. The transmission frame 220 comprises an extension state of transmitting the management terminal to a designated position when applying a certain pull force to the transmission frame 220, and a retraction state of retracting the management terminal to the U-shaped enclosure wall 212 when applying a certain external force to the transmission frame 220. In this way, through the transmission frame 220 with multi-freedom degree, the management terminal can be transmitted in any direction during the usage, thus improving the usage convenience. During the accommodation process, the management terminal can be retracted into the positioning space 201 of the U-shaped enclosure sidewall 212.

Referring Figs.5 and 6 simultaneously, specifically, the transmission frame 220 comprises a support base 221, a first adapting arm 222 and a second adapting arm 223. The support base 221 is rotatablely connected to the upper side of the main base body 211. One end of the first adapting arm 222 is rotatablely connected with the support base 221 and can be swung in the first vertical plane. The adaption axis between the first adapting arm 222 and the support base 221 is perpendicular to the first plane. The other end of the first adapting arm 222 is rotatablely connected with one end of the second adapting arm 223 and can be rotated relative to the second vertical plane. The adaption axis between the second adapting arm 223 and the first adapting arm 222 is located in the second vertical plane, and the angle between the first vertical plane and the second vertical plane is θ, wherein $0° < \theta \leq 90°$. The other end of the second adapting arm 223 is detachably connected with the management terminal. In this way, the rotation and swing operation can be realized.

Referring Figs.4-6 simultaneously, specifically, the transmission frame 220 further comprises an extension arm 224, wherein one end of which is rotatablely connected with the end

of the second adapting arm 223 far away from the first adapting arm 222. The management terminal is detachably connected to the other end of the extension arm 224. The management terminal is inserted in the positioning space 201 when the extension arm 224 is rotatablely folded to the second adapting arm 223. In this way, the stretching and pushing back operation can be realized.

Referring Figs.5 and 6 simultaneously, specifically, the transmission frame 220 further comprises an adapter 225 and a clamping piece 226. The end of the adapter 225 is rotatablely connected with the end of the extension arm 224 far away from the second adapting arm 223, and the side of the adapter 225 is provided with a spherical groove 2201.

Referring Figs.5-7 simultaneously, the clamping piece 226 comprises a spherical portion 2261, a connection portion 2262 and a clamping portion 2263. The connection portion 2262 is connected with the spherical portion 2261 and the clamping portion 2263. The spherical portion 2261 is inserted into the spherical groove 2201 and is matched with the spherical groove 2201, the spherical portion 2261 is position-limited in the spherical groove 2201 and can rotate and / or swing relative to the spherical groove 2201. The clamping portion 2263 is clamped to the management terminal. In this embodiment, the connection portion 2262 is inserted into the clamping groove 2301 of the clamping frame 230. The clamping portion 2263 is inserted into the position limitation groove 2304 and clamped therein.

Referring Figs.5-7 simultaneously, preferably, the installation platform 200 further comprises a clamping frame 230 fixedly connected with the management terminal, a free end of the transmission frame 220 is detachably connected with the clamping frame 230.

Referring Figs.6-7 simultaneously, specifically, the clamping frame 230 further comprises a main frame body 231 fixedly connected with the management terminal, and a clamping structure 232 connected with the main frame body 231. The main frame body 231 is provided with a clamping groove 2301. One end of the clamping structure 232 can be inserted into the clamping groove 2301 elastically or be withdrawn from the clamping groove 2301 elastically under the action of an external force. The free end of the transmission frame 220 is inserted into the clamping groove 2301 and position-limited in the clamping groove 2301 through the clamping structure 232. In this way, through the clamping cooperation between the free end of the transmission frame 220 and the clamping frame 230 of the management terminal, the

management terminal can be freely removed from the transmission frame 220 and taken as needed.

Referring Figs.6-7 simultaneously, specifically, the clamping structure 232 comprises two elastic clamping assemblies 2321. The main frame body 231 is provided with an accommodation groove 2302 on two opposite groove walls of the clamping groove 2301. One end of each elastic clamping assembly 2321 is connected in one accommodation groove 2302, while the other end of each elastic clamping assembly 2321 can be elastically retracted to the accommodation groove 2302 under an external force action, and elastically extended into the clamping groove 2301 without the external force action.

Referring Figs.6-7 simultaneously, specifically, each elastic clamping assembly 2321 comprises an elastic piece 23211 and a clamping block 23212. The elastic piece 23211 is arranged in the accommodation groove 2302, and one end of the elastic piece 23211 is connected with the main frame body 231 while the other end of the elastic piece 23211 is connected with one end of the clamping block 23212. The other end of the clamping block 23212 is extended into the clamping groove 2301 under an elastic force of the elastic piece 23211. An inclined guide plane 2303 is arranged at an end of the clamping block 23212 contacting the free end of the transmission frame 220, and the inclined guide plane 2303 is extended towards an insertion direction of the free end. In this way, the free end of the transmission frame 220 can be positioned and clamped into the clamping groove 2301along the inclined guide plane 2303 to improve the clamping smoothness and efficiency.

Referring Figs.6-7 simultaneously, specifically, a position limitation groove 2304 is arranged on a surrounding side of the clamping groove 2301. The position limitation groove 2304 is communicated with the clamping groove 2301, the free end of the transmission frame 220 is inserted into the clamping groove 2301 and stuck at the groove bottom of the position limitation groove 2304.

Referring Figs.6-7 simultaneously, specifically, the end of the transmission frame 220 located in the position limitation groove 2304 is circumferentially position-limited in the position limitation groove 2304. It can be understood that the cross section of the end of the transmission frame 220 in the position limitation groove 2304 has a non-circular outer contour which matches with the position limitation groove 2304. The free end of the transmission frame 220 is

circumferentially position-limited, so as to avoid the management terminal from rotating freely on the transmission frame 220, which is inconvenient to use and store.

Referring Figs.6-7 simultaneously, in this embodiment, a position limitation space is formed between the position limitation groove 2304 and the surface of the management terminal facing the position limitation groove 2304. The end of the transmission frame 220 is inserted into this position limitation space. Then the clamping end of the clamping block 23212 is pushed to the clamping groove 2301 by the elastic restoring force of the elastic piece 23211, so as to limit the position of the end of the transmission frame 220 to the clamping groove 2301, thus effectively preventing the end of the transmission frame 220 from being detached from the clamping frame 230.

Referring Figs.6-7 simultaneously, specifically, the main frame body 231 is provided with a slide joint groove 2305 on two opposite groove walls in each accommodation groove 2302, respectively. Each slide joint groove 2305 extends to the surface of the main frame body 231 facing the management terminal and communicates with the clamping groove 2301.

The two opposite sides of the clamping block 23212 facing each other are respectively provided with a slide joint platform 23213, and each slide joint platform 23213 is respectively inserted into one slide joint groove 2305. In this way, on the one hand, the clamping block 23212 can slide directionally in the corresponding accommodation groove 2302, on the other hand, the slide joint groove 2305 extends to the surface of the main frame body 231 facing the management terminal to limit the position of the clamping block 23212 and prevent it from leaving the accommodation groove 2302. Furthermore, the assembly convenience is improved.

Referring Figs.6-7 simultaneously, specifically, the clamping frame 230 further comprises two position limitation bosses 233 protruding from the groove bottom of each slide joint groove 2305. Each position limitation boss 233 is arranged next to the clamping groove 2301.

Each clamping block 23212 is provided with a groove 2306 on the end face opposite to the elastic piece 23211. Each position limitation boss 233 is inserted into the groove 2306 when the position limitation end of the clamping block 23212 extends into the clamping groove 2301. The clamping ends of the two clamping blocks 23212 have a safe distance. In this way, the safety distance is always kept when the two clamping blocks 23212 slide to the extreme position under the elastic restoring force of the elastic piece 23211, so as to avoid the damage of the two clamping blocks 23212 due to the collision.

Referring Figs.6-7 simultaneously, specifically, a handle protrusion 23214 is arranged at the side of the clamping block 23212 away from the management terminal. When the management terminal needs to be removed, the staff just needs to slide the handle protrusion 23214 with the thumbs of both hands moving away from each other, such that the end of the clamping block 23212 would retract into the accommodation groove 2302, then the transmission frame 220 can be separated from the clamping groove 2301to realize the removal operation of the management terminal. After the management terminal is removed, the two handle protrusions 23214 are released. Under the elastic restoring force of each elastic piece 23211, the end of each clamping block 23212 automatically extends into the clamping groove 2301.

Referring Figs.6-7 simultaneously, specifically, the groove opening of the clamping groove 2301is provided with an arc guide surface or an inclined guide plane. In this way, the transmission frame 220 can be easily inserted into the clamping groove 2301 through the positioning and guiding function of such arrangement.

In this embodiment, each elastic piece 23211 is a spring. The groove bottom of each accommodation groove 2302 is provided with a placement hole, two clamping blocks 23212 are respectively provided with insertion holes at opposite ends. One end of the spring is inserted in the placement hole, and the other end of the spring is inserted in the insertion hole to realize the connection of the main frame body 231, the elastic piece 23211 and the clamping block 23212.

Referring Figs.3, 4 and 8 simultaneously, preferably, the intelligent transmission mechanism 1 further comprises a linkage assembly 500 and a transmission assembly 600 corresponding to the protective door 300 one by one.

The installation frame 100 further comprises a position limitation plate 120 corresponding to the protective door 300 one by one and a body 110 provided with the accommodation cavity 101 and the opening 102. Each of the position limitation plate 120 is connected with the cavity wall of the accommodation cavity 101 for dividing the accommodation cavity 101 into a main cavity 1011 for sliding the installation platform 200 up and down and a secondary cavity 1012 for sliding the transmission assembly 600 up and down. The upper end of the transmission assembly 600 is articulated with the protective door 300, while the lower end of the transmission assembly 600 is connected with the installation platform 200 through the linkage assembly 500. The protective door 300 is accommodated in the secondary cavity 1012 during the opening state. In this embodiment, the secondary cavity 1012 on the one hand, can provide a channel

environment for the directional transmission of the transmission assembly 600, and on the other hand, can accommodate the protective door 300 when each protective door 300 is opened.

Referring Figs.3-4 simultaneously, specifically, the linkage assembly 500 comprises an adapting wheel 510 fixed on the cavity wall of the accommodation cavity 101, and a connection piece (unshown) sleeved on the adapting wheel 510, wherein one end of the connection piece is fixed to the installation platform 200 and the other end of the connection piece is fixed to the transmission assembly 600.

In this embodiment, the adapting wheel 510 plays the role of transition connection, so as to avoid the occurrence of hard corners when the connection piece is directly connected between the installation platform 200 and the transmission assembly 600, thus avoiding the wear and jamming. The adapting wheel 510 is arranged below the lower extremity position of the transmission assembly 600. The connection piece is steel wire rope.

Referring Figs.3, 4 and 8 simultaneously, specifically, the transmission assembly 600 comprises at least one roller 610 and a guide structure 620 penetrating through the secondary cavity 1012 with its upper end articulated with the protective door 300 and lower end connected with the linkage assembly 500. Each roller 610 is fixed on a lower side of the protective door 300 and located at an articulated end of the protective door 300. The position limitation plate 120 corresponding to the transmission assembly 600 is arranged with a guide plate 121protruded at its upper end and corresponding to each roller 610 one by one. Each guide plate 121 is arranged upward and extended towards the main cavity 1011 obliquely. The roller 610 can collide with the guide plate 121 and roll on the guide plate 121 when the protective door 300 is opened or closed. In this way, when each protective door 300 is closed and opened, the ninety degrees rotation transition during the closing and opening of each protective door 300 can be realized by rolling the roller 610 of each protective door 300 on the guide plate 121 extended obliquely. When each protective door 300 is opened, the torque applied to each protective door 300 can be reduced. When each protective door 300 is closed, the strong collision caused by the fast door closing can be avoided.

Referring Figs.3, 4 and 8 simultaneously, specifically, the guide structure 620 comprises a transmission piece 621 and a guide block 622 provided with a guide channel penetrating through the guide block 622 perpendicularly and fixed on the cavity wall of the accommodation cavity 101 or the secondary cavity 1012. The transmission piece 621 is penetrating through the guide

channel and the secondary cavity 1012. The upper end of the transmission piece 621 is connected with the protective door 300 through an articulated piece with an elastic recovery force, the lower end of the transmission piece 621 is connected with the linkage assembly 500. In this embodiment, each protective door 300 extends to the outside when the management terminal is located in the accommodation position 103, and automatically closes at the opening 102 by the articulated piece with the elastic recovery force.

In the present embodiment, each transmission piece 621 comprises two transmission rods 6211 arranged in parallel, a lower end piece 6212 connected with the lower end of the two transmission rods 6211, and an upper end piece 6213 connected with the upper end of two transmission rods 6211. Two guide channels are provided, and each transmission rod 6211 passes through one guide channel respectively and slides directionally relative to the guide channel. The protective door 300 is connected to the upper end piece 6213 through the articulated piece with the elastic recovery force, and one end of the steer wire rope is connected to the lower end piece 6212.

Referring Figs.3, 4 and 8 simultaneously, specifically, the transmission assembly 600 further comprises an elastic reset piece (unshown), one end of which is fixed to the body 110 of the installation frame 100, the other end of which is connected with the transmission piece 621. The reset piece has an elastic recovery force F1 when the protective door 300 is in the closed state while has an elastic recovery force F2 when the protective door 300 is in the open state and F2 > F1. The protective door 300 is automatically closed by an action of the elastic recovery force F2 after removing a drive control of the drive device 400. In this embodiment, the closing of each protective door 300 does not depend on the drive device 400, but on the elastic restoring force of the reset member and the elastic restoring force of the articulated piece.

Referring Figs. 1-2 simultaneously, the embodiment of the present application has further provided a border control eGate, which comprises a main body, a management terminal and an intelligent transmission mechanism 1 as described above arranged at one end of the main body. The management terminal is detachably arranged on the intelligent transmission mechanism 1.

In the present application, by arranging the intelligent transmission mechanism 1 on the one end of the main body, the management terminal and the border control eGate are perfectly integrated, such that the requirements of the staff to manage the device, set the device parameters and review the device status at any time and so on can be satisfied. Meanwhile, the safety of the

management terminal is guaranteed, the convenience for staff is provided while the time and cost are saved.

The above descriptions are only better embodiments of the present application, and not to limit the present application. Any modification, equivalent replacement and improvement made within the spirit and principle of the present application shall be included in the protection scope of the present application.

CLAIMS

1. An intelligent transmission mechanism arranged at one end of a border control eGate wherein, a management terminal communicating with the border control eGate is connected with the intelligent transmission mechanism, wherein the intelligent transmission mechanism comprises a control panel, an installation frame, an installation platform, a drive device and a protective door; wherein the installation frame is provided with an accommodation cavity and an opening, at least one protective door is provided and articulated at the opening, the control panel is in a control connection with the drive device, the installation platform is arranged in the accommodation cavity and driven by the drive device to move up and down in the accommodation cavity; the installation platform has an accommodation position and a transmission position in the accommodation cavity, the management terminal is accommodated in the accommodation cavity when the installation platform is located at the accommodation position and is extended from the opening to outside when the installation platform is located at the transmission position; each protective door is linked with the installation platform and has a closed state of covering the opening together when the installation platform is located at the accommodation position and an opening state of rotating away from the opening together when the installation platform is located at the transmission position.

2. The intelligent transmission mechanism according to claim 1, wherein the installation platform comprises a base provided with a main base body and a U-shaped enclosure wall with a positioning space; wherein the main base body is placed horizontally in the accommodation cavity, the U-shaped enclosure wall is located on an upper side of the main base body while an end of the management terminal is inserted and positioned in the positioning space.

3. The intelligent transmission mechanism according to claim 2, wherein the drive device comprises a power source and a screw rod butted with a power output shaft of the power source and rotated synchronously, wherein the screw rod is extended between the accommodation position and the transmission position, the main base body is threaded with the screw rod, and the main base body is position-limited in the accommodation cavity along a circumferential direction.

4. The intelligent transmission mechanism according to claim 2, wherein the installation platform further comprises a transmission frame with multi-freedom degree, one end of which is

rotatablely connected to the upper side of the main base body, and other end of which is detachably connected with the management terminal; wherein the transmission frame comprises an extension state of transmitting the management terminal to a designated position when applying a certain pull force to the transmission frame, and a retraction state of retracting the management terminal to the U-shaped enclosure wall when applying a certain external force to the transmission frame.

5. The intelligent transmission mechanism according to claim 4, wherein the installation platform further comprises a clamping frame fixedly connected with the management terminal, a free end of the transmission frame is detachably connected with the clamping frame.

6. The intelligent transmission mechanism according to claim 5, wherein the clamping frame further comprises a main frame body fixedly connected with the management terminal, and a clamping structure connected with the main frame body; wherein the main frame body is provided with a clamping groove, the free end of the transmission frame is inserted into the clamping groove and position-limited in the clamping groove through the clamping structure.

7. The intelligent transmission mechanism according to claim 6, wherein the clamping structure comprises two elastic clamping assemblies, the main frame body is provided with an accommodation groove on two opposite groove walls of the clamping groove, one end of each elastic clamping assembly is connected in one accommodation groove, other end of each elastic clamping assembly can be elastically retracted to the accommodation groove under an external force action, and elastically extended into the clamping groove without the external force action.

8. The intelligent transmission mechanism according to claim 7, wherein each elastic clamping assembly comprises an elastic piece and a clamping block, the elastic piece is arranged in the accommodation groove , one end of the elastic piece is connected with the main frame body while other end of the elastic piece is connected with one end of the clamping block, other end of the clamping block is extended into the clamping groove under an elastic force of the elastic piece, an inclined guide plane is arranged at an end of the clamping block contacting the free end of the transmission frame, and the inclined guide plane is extended towards an insertion direction of the free end.

9. The intelligent transmission mechanism according to claim 6, wherein a position limitation groove is arranged on a surrounding side of the clamping groove, wherein the position limitation groove is communicated with the clamping groove, wherein the free end of the

transmission frame is inserted into the clamping groove and stuck at a groove bottom of the position limitation groove.

10. The intelligent transmission mechanism according to any one of claims 1-9, wherein the intelligent transmission mechanism further comprises a linkage assembly and a transmission assembly corresponding to the protective door one by one;

wherein the installation frame further comprises a position limitation plate corresponding to the protective door one by one and a body provided with the accommodation cavity and the opening; each of the position limitation plate is connected with a cavity wall of the accommodation cavity for dividing the accommodation cavity into a main cavity for sliding the installation platform up and down and a secondary cavity for sliding the transmission assembly up and down, an upper end of the transmission assembly is articulated with the protective door, and a lower end of the transmission assembly is connected with the installation platform through the linkage assembly, wherein the protective door is accommodated in the secondary cavity during the opening state.

11. The intelligent transmission mechanism according to claim 10, wherein the linkage assembly comprises an adapting wheel fixed on the cavity wall of the accommodation cavity, and a connection piece sleeved on the adapting wheel, wherein one end of the connection piece is fixed to the installation platform and other end of the connection piece is fixed to the transmission assembly.

12. The intelligent transmission mechanism according to claim 10, wherein the transmission assembly comprises at least one roller and a guide structure penetrating through the secondary cavity with its upper end articulated with the protective door and lower end connected with the linkage assembly; each roller is fixed on a lower side of the protective door and located at an articulated end of the protective door; the position limitation plate corresponding to the transmission assembly is arranged with a guide plate protruded at its upper end and corresponding to each roller one by one; each guide plate is arranged upward and extended towards the main cavity obliquely, the roller can collide with the guide plate and roll on the guide plate when the protective door is opened or closed.

13. The intelligent transmission mechanism according to claim 12, wherein the guide structure comprises a transmission piece and a guide block provided with a guide channel penetrating through the guide block perpendicularly and fixed on a cavity wall of the

accommodation cavity or the secondary cavity; wherein the transmission piece is penetrating through the guide channel and the secondary cavity, wherein an upper end of the transmission piece is connected with the protective door through an articulated piece with an elastic recovery force, a lower end of the transmission piece is connected with the linkage assembly.

14. The intelligent transmission mechanism according to claim 13, wherein the transmission assembly further comprises an elastic reset piece, one end of which is fixed to the body of the installation frame, other end of which is connected with the transmission piece, the reset piece has an elastic recovery force F1 when the protective door is in the closed state while has an elastic recovery force F2 when the protective door is in the open state and F2 > F1; wherein the protective door is automatically closed by an action of the elastic recovery force F2 after removing a drive control of the drive device.

15. The intelligent transmission mechanism according to any one of claims 2-9, wherein the intelligent transmission mechanism further comprises a charging structure electrically connected to the control panel, the charging structure is fixed in the accommodation cavity, and the main base body is provided with a charging port opposite to a charging port of the management terminal, wherein the management terminal is accommodated in the accommodation cavity and charged by docking with the charging structure through the charging port when the installation platform is in the accommodation position.

16. A border control eGate comprising a main body, a management terminal and an intelligent transmission mechanism according to any one of claims 1-15, wherein the intelligent transmission mechanism is arranged at one end of the main body, the management terminal is detachably arranged on the intelligent transmission mechanism.