

INTEGRATED VENDING MACHINE MANAGEMENT SYSTEM AND APPARATUS THEREOF

TECHNICAL FIELD

The present invention relates to the technical field of vending machines, in particular to an integrated vending machine management system and an apparatus thereof.

BACKGROUND

With the development of science and technology and the increasing requirements of consumers on convenience and rapidity of life, vending machines are also in public places such as streets and alleyways, the vending machines are also called selling machines, and are machines capable of automatically paying goods according to money, and the functions of the vending machines are increasingly improved along with the improvement of the levels of automation devices and computers. Common vending machines include beverage vending machines, food vending machines, integrated vending machines, cosmetics vending machines, etc. on the market at present, the structure of which mainly includes a payment apparatus, an indicating apparatus, and a goods storage apparatus. The payment apparatus is mainly used for consumers to pay the goods, and the payment mode is: using Alipay, WeChat and the like on the mobile phone to scan a two-dimensional code for payment, and cash payment; the indicating apparatus is mainly used for goods checking, goods supply and the like of sales service personnel; and a storage system is mainly used for storing goods to be sold.

However, the existing vending machines have many defects, which seriously affect the convenience of use of consumers and sales service personnel, for example, (1) the existing vending machine replenishment mode is a regular replenishment mode, and the sales service personnel cannot accurately acquire the goods supply condition in the vending machines in real time, and can find out whether the goods are out of stock or not only during regular replenishment or regular field inspection, causing short of goods in the storage apparatus; (2) the functions are single, when the consumers have purchase demands, the consumers cannot quickly acquire the accurate position of the vending machines and the stock condition in the vending machines, so that whether a

device for supplying corresponding goods exists nearby cannot be judged, and the purchase convenience is greatly influenced; (3) the goods temporary storage function is lacked, and the consumers can only take the goods away after purchasing the goods and cannot temporarily store the goods; (4) the existing vending machines can not recommend goods for a specified group of people; (5) the existing vending machines cannot be used by persons disabled in action, subsidized personnel or volunteer personnel. Thus the invention of a multifunctional integrated vending machine through which the sales service personnel conveniently monitor the supply condition in real time, the consumers conveniently and quickly obtain the accurate position of nearby devices, goods are convenient to be stored and taken out, and the purchase requirements of the subsidized personnel or the volunteer personnel can be met, becomes a problem to be solved urgently for those in the field.

Technical problem

In order to solve the above problems, the present invention provides a multifunctional integrated vending machine which has various functions, is convenient for consumers to use, is convenient for sales service personnel, technicians, investors and a special group to use, and can greatly improve the use convenience.

Technical solution

In order to realize the objective, the present invention adopts the following technical solutions:

An integrated vending machine management system is configured to manage a vending machine apparatus, the management system includes an application terminal and a management platform, the application terminal includes a consumer module, a sales service module and a technician module, and the consumer module, the sales service module, the technician module and an investor module are realized on the basis of the vending machine apparatus and a terminal device. The terminal device includes a mobile terminal and a computer terminal.

The application terminal further includes a special group module and the investor module.

The consumer module refers to that consumers select, purchase or store goods in the vending machine apparatus through the terminal device or an interactive interface of the vending machine apparatus.

The sales service module refers to that sales service personnel increase, decrease or replace goods in the vending machine apparatus at a specified place and in a specified time through big data information of the terminal device.

The technician module refers to that technicians maintain or repair the vending machine apparatus at a specified place through the information of the terminal device.

The investor module refers to that an investor knows sale, inventory, profit and position information of the vending machine apparatus invested by the investor through the terminal device, and sends an automatic checking instruction through the terminal device so as to obtain the latest sale or inventory data of the corresponding vending machine apparatus.

The special group module refers to that a group with special requirements selects, purchases or stores goods in the vending machine apparatus through the terminal device or the interactive interface of the vending machine apparatus.

The management platform includes a big data processing module, and the big data processing module refers to storing or processing data generated by the vending machine apparatus or data generated by the terminal device.

Further,

the management platform includes a positioning module, and the positioning module is configured to position specific position information of the vending machine apparatus and send the position information to the terminal device.

The positioning module includes a GPS positioning apparatus.

The management platform further includes an authority module, the authority module includes an identity recognition unit, a face recognition unit and a fingerprint recognition unit, the identity recognition unit is configured to recognize identity information of the consumers and the special group, and the face recognition unit is configured to collect and recognize face information of the special group.

The special group includes persons disabled in action, subsidized personnel or volunteer personnel.

The terminal device includes a mobile phone and/or a computer, consumption APP used by the consumers, service APP used by the sales service personnel, technology APP used by the technicians, investment APP used by the investors and subsidy APP used by the special group are installed in the mobile phone and/or the computer, and the mobile phone and/or the computer are in communication connection with the management platform through a communication module.

The management platform includes a goods selection unit, a payment unit, a login unit, a registration unit, a storage management unit, a cloud control lock unit and a cloud delivery unit.

The goods selection unit provides a list of products to be sold and is configured to select and manage the goods.

The payment unit is used for payment management.

The login unit is configured to provide a login port.

The registration unit is configured to register new product information.

The storage management unit is configured to carry out access management on the purchased goods.

The cloud control lock unit is configured to control a lock of the vending machine apparatus, includes an unlocking authority, and sets that a specified person has the authority to unlock the lock at a specified position within a specified time through the unlocking authority.

The cloud delivery unit is used for delivery management, after the consumers pay the goods, the quantity of goods purchased by the consumers can be deducted from an inventory in a vending machine from which the consumers purchase the goods; and if actual delivery is not generated after the consumers pay the goods, the goods can be automatically returned to the inventory for secondary sale.

The product list includes categories of products, discount products and preferred products.

The sales service personnel include goods replenishment/transfer personnel, storage personnel and material allocation personnel.

The technicians include repair/maintenance personnel.

The management platform further includes a registration unit, and the registration unit

is configured to register new product information.

The data of the vending machine apparatus includes, but is not limited to, daily, weekly, or monthly inventory, sales, and profit data of the vending machine apparatus. The management platform further includes a data backup module, and the data backup module backs up data generated by a cloud every day through the computer terminal so as to prevent poor operation caused by data loss.

An integrated vending machine apparatus includes a cabinet body, a main controller and a communication module, and the main controller is in communication connection with the terminal device through the communication module; a storage system, a conveying system, a bag discharging system, a cloud control lock system and a positioning module are disposed in the cabinet body; an interactive interface and a goods outlet are disposed at a front end of the cabinet body;

the positioning module is configured to determine position information of the vending machine apparatus, the positioning module is in communication connection with the terminal device, and the interactive interface is electrically connected to the main controller;

the storage system is configured to store goods;

the conveying system is configured to convey goods; and

the cloud control lock system is configured to control a lock.

Further,

the storage system includes a refrigeration or normal-temperature region and a freezing box body which are disposed in the cabinet body, a refrigeration refrigerating apparatus is disposed in the refrigeration or normal-temperature region and is configured to carry out refrigeration or normal-temperature storage of the goods, the freezing box body includes a freezing refrigerating apparatus configured to freeze and store the goods, and the refrigeration refrigerating apparatus and the freezing refrigerating apparatus are electrically connected to the main controller.

The conveying system includes a plurality of layers of material trays distributed side by side, a plurality of goods channels disposed on each layer of material trays and distributed side by side, spiral push rods or crawler-type conveying belts disposed on the goods channels, and a goods conveying belt disposed below outer side ends of the

goods channels, the goods outlet is located at one end of the goods conveying belt, the material trays are slidably installed in the refrigeration or normal-temperature region and the freezing box body through guide rail structures, a baffle is disposed at an inner side end of each goods channel, an inventory counter is fixed on each baffle and configured to detect quantity information of goods on the goods channel, the inventory counters are electrically connected to a first controller, and the first controller is electrically connected to the main controller.

Each inventory counter includes a range finder and a limit switch, the range finder and the limit switch are both electrically connected to the first controller, and the limit switch is fixed on one side of a guide rail, corresponds to the inner side end of the material tray and is configured to detect position information of the material tray. The range finder is fixed in a middle portion of the baffle through a range finder base, the range finder base includes a fixing base and a detachable base clamped with the fixing base, the detachable base includes a T-shaped plate, the T-shaped plate includes a transverse plate and a vertical plate vertically fixed to a bottom end of the transverse plate, the transverse plate and the vertical plate are integrally formed, the transverse plate is of a groove structure with an open top end, the top end of the transverse plate is covered with a cover plate, a through hole is formed in a middle portion of the cover plate, the range finder is fixed in the groove, an emitting end of the range finder corresponds to the through hole, the vertical plate is of a trapezoidal structure with a narrow top and a wide bottom, a tapered through groove matched with the vertical plate in shape is formed in one side end of the fixing base, the detachable base is clamped in the through groove through the vertical plate, and the range finder is configured to detect position information of goods in the goods channel.

The cabinet body further includes a falling detection apparatus, the falling detection apparatus includes a light source emitter and a light source receiver, the light source emitter is configured to send infrared light or laser, the light source receiver is configured to receive the infrared light or the laser sent by the light source emitter, the infrared light or the laser is sent in a single-point mode or a multi-point mode, and the light source emitter and the light source receiver are both electrically connected to the main controller.

The light source emitter and the light source receiver are respectively disposed at two side ends of the goods conveying belt, and the light source emitter and the light source receiver are distributed correspondingly.

The falling detection apparatus further includes a light source reflecting plate, the light source emitter and the light source receiver are disposed at the other end of the goods conveying belt side by side, the light source reflecting plate is disposed at one end of the goods conveying belt, and the light source reflecting plate corresponds to an emitting end of the light source emitter and a receiving end of the light source receiver.

A prompting lamp is installed at an outer side end of each goods channel, a scanner is disposed on the interactive interface, the prompting lamps and the scanner are electrically connected to the main controller, the prompting lamps are configured to prompt a position needing goods replenishment, and the scanner is configured to scan bar code information of the goods or two-dimensional code information in the mobile terminal.

The bag discharging system is disposed at a front end of the cabinet body and includes a rolled bag mounting frame, a scroll rotatably installed on the rolled bag mounting frame, a rolled bag wound on the scroll, a bag pressing mechanism and rolled bag supporting rods, the rolled bag supporting rods are configured to support the rolled bag, and the bag pressing mechanism is configured to press the rolled bag.

The rolled bag support rods include a first rolled bag support rod, a second rolled bag support rod and a third rolled bag support rod which are distributed in sequence, one end of the rolled bag is wound on the scroll, the other end of the rolled bag is wound on the first rolled bag support rod, the second rolled bag support rod and the third rolled bag support rod in sequence, and a photoelectric switch is disposed at a top end of the rolled bag mounting frame and one side of the scroll and configured to detect whether the rolled bag is discharged or not.

The bag pressing mechanism includes a support frame disposed on the other side of the scroll, an upper bag pressing mechanism and a lower bag pressing mechanism, the upper bag pressing mechanism and the lower bag pressing mechanism are installed on the support frame, the lower bag pressing mechanism includes a lower pressing plate

and a first electric push rod for driving the lower pressing plate to press, the upper bag pressing mechanism includes an upper pressing plate and tension springs for driving the upper pressing plate to press, and the photoelectric switches and the first electric push rod are electrically connected to a second controller.

The first electric push rod is fixed on the support frame, a top end of the lower pressing plate is fixed with a push rod of the first electric push rod, a bottom end of the lower pressing plate corresponds to the second rolled bag support rod, the rolled bag is located between the lower pressing plate and the second rolled bag support rod, one end of the upper pressing plate is hinged with the support frame, one end of the tension springs are fixed with two side ends of the upper pressing plate, the other end of the tension springs are fixed at the top end of the lower pressing plate, and a bottom end of the upper pressing plate is pressed against a top end of the rolled bag by pulling of the tension springs.

The cloud control lock system includes an electric lock, a magnetic card recognition region disposed in the electric lock, and a lock control system disposed in the electric lock, the magnetic card recognition region is matched with a magnetic card, the lock control system includes a third controller, a clock chip, a motor and a storage module, the clock chip, the motor and the storage module are all electrically connected to the third controller, the third controller is electrically connected to the main controller, the clock chip is configured to set unlocking time, the motor is configured to drive a spring bolt of the electric lock to be opened or closed, and the storage module is configured to store a preset unlocking time threshold value.

An outlet end of the freezing box body is provided with a plurality of box doors, top ends of the box doors are hinged with the freezing box body, two ends of each box door are respectively provided with second electric push rods, one end of each second electric push rod is hinged with a side end of the corresponding box door, the other end of each second electric push rod is hinged with a side end of the freezing box body, and the second electric push rods are electrically connected to the main controller.

The cabinet body is internally provided with a storage cabinet system, the storage cabinet system is configured to store goods, the storage cabinet system includes a

plurality of storage cabinets, temperature sensors installed in the storage cabinets, and cabinet doors installed on the storage cabinets, one side ends of the cabinet doors are hinged with the storage cabinets, the temperature sensors are configured to collect temperature information in the storage cabinets, the storage cabinets are communicated with the freezing box body through pipelines, solenoid valves and fans are installed in the pipelines, the temperature sensors and the solenoid valves are electrically connected to a fourth controller, and the fourth controller is electrically connected to the main controller.

Beneficial effects

By adopting the above structure of the present invention, the following beneficial effects can be achieved: (1) The management system includes the consumer module, the special group module, the technician module, the sales service personnel module and the investor module, so that the vending machine not only meets the purchase demands of different people, but also is convenient for technicians, sales service personnel and investors to manage, and improves the convenience in use and management; and the consumers and the special group can also store goods using the vending machine, the functions are diverse, and the use convenience is greatly improved.

(2) The management system includes the sales service personnel module, the sales service personnel can timely know the goods supply condition in the vending machine apparatus through the big data information of the terminal device, so as to increase, decrease or replace goods of the vending machine apparatus at a specified place and in a specified time, the problem of goods shortage caused by untimely goods supply is avoided, and the use convenience is improved.

(3) The management system and the apparatus include the positioning module, the consumers and the special group can accurately acquire the position information of the vending machine through the positioning module, so that whether a device for supplying corresponding goods exists nearby can be quickly judged, the nearby vending machine can be quickly and accurately found, the purchase convenience is improved; the sales service personnel, the technicians and the investors can quickly

and accurately acquire the position and the goods supply condition of the vending machine through the terminal device, so as to conveniently manage the vending machine, and the management convenience is greatly improved.

(4) The vending machine is in communication connection with the terminal device through the communication module, so that the consumers and the special group not only can select and purchase goods through a touch screen on the cabinet body, but also can send signals to an automatic control system of the vending machine through the terminal device to remotely control the vending machine, the remote selection and purchase of the goods are realized, and thus the use convenience is improved.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a structural block diagram of a management system according to the present invention;

FIG. 2 is a schematic diagram of a three-dimensional structure according to Embodiment I of the present invention;

FIG. 3 is a schematic diagram of a three-dimensional structure according to Embodiment II of the present invention;

FIG. 4 is a schematic diagram of a three-dimensional structure according to Embodiment III of the present invention;

FIG. 5 is a schematic diagram of a three-dimensional structure of a conveying system in a cabinet body according to the present invention;

FIG. 6 is a schematic diagram of a three-dimensional structure of a range finder mounting base according to the present invention;

FIG. 7 is a structural block diagram of a control system of a cloud control lock system according to the present invention;

FIG. 8 is a schematic diagram of a three-dimensional structure of Embodiment I of a falling detection apparatus according to the present invention;

FIG. 9 is a schematic diagram of a three-dimensional structure of Embodiment II of a falling detection apparatus according to the present invention;

FIG. 10 is a schematic diagram of a three-dimensional structure of a bag discharging system according to the present invention;

FIG. 11 is a schematic diagram of a three-dimensional structure of connection between a box door and a freezing box body according to the present invention;

FIG. 12 is a schematic diagram of a three-dimensional structure of a storage cabinet system according to the present invention; and

FIG. 13 is a schematic diagram of a three-dimensional structure of Embodiment IV according to the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

Referring to FIG. 1 and FIG. 2, in Embodiment I, an integrated vending machine apparatus includes a cabinet body 1, and a storage system 2, a conveying system 3, a cloud control lock system 4, a storage cabinet system 5, a positioning module 10, and a communication module which are installed in the cabinet body 1; the front end of the cabinet body 1 is provided with an interactive interface 11, a goods outlet 31 and the storage cabinet system 5, the positioning module 10 is a GPS positioning apparatus, and the communication module includes WIFI or 4G/5G wireless communication. The cabinet body 1 is a heat preservation box body and is configured to keep the internal temperature within the room temperature or the refrigeration temperature range. In this embodiment, the interactive interface 11 and the goods outlet 31 include a set and are distributed at one side end of a goods conveying belt 7, and the interactive interface 11 and the positioning module 10 are electrically connected to a main controller. The GPS positioning apparatus is configured to position and send position information of the corresponding vending machine apparatus to a mobile phone, so that consumers, sales service personnel, technicians, investors, technical service personnel and special group personnel can find the specified vending machine apparatus conveniently through a map or navigation, and meanwhile, the vending machine apparatus in the specified position is prevented from being moved under the condition of no notification, namely, when the vending machine apparatus is not allowed to move to the position outside the specified range, the main controller may send a corresponding early warning signal to a mobile phone of an investor to give early warning prompt.

The storage system 2 includes a refrigeration or normal-temperature region 21 and a

freezing box body 22 which are disposed in the cabinet body 1 and separated from each other, a refrigeration refrigerating apparatus is disposed in the refrigeration or normal-temperature region 21 and is configured to carry out refrigeration or normal-temperature storage of goods, the freezing box body 22 includes a freezing refrigerating apparatus configured to freeze and store the goods, and the refrigeration refrigerating apparatus 210 and the freezing refrigerating apparatus 220 are electrically connected to the main controller, and the sizes and positions of the refrigeration or normal-temperature region 21 and the freezing box body 22 may be set flexibly according to actual demands. In this embodiment, failure detection apparatuses are installed in the refrigeration or normal-temperature region 21 and the freezing box body 22, when the vending machine breaks down, the failure detection apparatuses (for example, temperature sensors installed in the refrigeration or normal-temperature region 21 and the freezing box body 22 and configured to detect the temperature in real time, the temperature sensors are electrically connected to the main controller, temperature information in the storage system 2 is collected through the temperature sensors, and sent to the main controller, and when it is detected that the temperature information in the corresponding region exceeds a threshold value, the main controller sends a signal into technology APP used by the technicians through the WIFI or 4G/5G wireless communication) send a fault signal into the technology APP used by the technicians, and inform maintainers to check the vending machine apparatus, the fault of the vending machine apparatus is found and handled in time, and goods in each temperature region are prevented from being damaged.

Referring to FIG. 11, a plurality of box doors 23 are disposed at the outlet ends of the refrigeration or normal-temperature region 21 and the freezing box body 22 (in this embodiment, the quantity of the box doors is the same as the quantity of material trays, and if four layers of material trays are included, the quantity of the box doors is four), the top ends of the box doors 23 are hinged with the refrigeration or normal-temperature region 21 or the freezing box body 22, second electric push rods 24 symmetrically distributed are disposed at two ends of the box doors 23, one end of each second electric push rod 24 is hinged with the side end of the box door 23, the other end of each second electric push rod 24 is hinged with the side end of the

freezing box body 22, and the second electric push rods 24 are electrically connected to the main controller. When the goods need to be delivered from the freezing box body 22 and the main controller receives a delivery instruction, the second electric push rods 24 are controlled to push the box doors to rotate and open, otherwise, the second electric push rods 24 are retracted, the box doors 23 are closed, sealing rubber strips are disposed between the box doors 23 and the freezing box body 22, and when the box doors close the freezing box body or the refrigeration or normal-temperature region under the comprehensive action of the second electric push rods on the two sides, the sealing effect is achieved.

Referring to FIG. 5, each of the refrigeration or normal-temperature region 21 and the freezing box body 22 is internally provided with the conveying system 3, the conveying system 3 includes a plurality of layers of material trays 30 distributed side by side, a plurality of goods channels 32 disposed on the material trays 30 and distributed side by side, and spiral push rods 33 or crawler-type conveying belts 34 disposed in the goods channels 32. Baffles 35 are disposed at the inner side ends of the goods channels 32, inventory counters 36 are installed on the baffles 35, the inventory counters 36 are configured to detect displacement information of the goods on the goods channels 32, and the goods conveying belt 7 is disposed at the outer side ends (goods outlet ends) of the goods channels 32 and located below the goods outlet ends. Each inventory counter 36 includes a range finder and a limit switch 361, the range finder and the limit switch 361 are both electrically connected to a first controller, and the limit switch 361 is fixed on one side of a guide rail, corresponds to the inner side end of the corresponding material tray 30 and is configured to detect the position information of the material tray 30. The range finder is fixed in the middle portion of the baffle 35 through a range finder base 37, referring to FIG. 6, the range finder base 37 includes a fixing base 371 and a detachable base 372 clamped with the fixing base 371, the detachable base 372 includes a T-shaped plate, the T-shaped plate includes a transverse plate and a vertical plate vertically fixed to the bottom end of the transverse plate, the transverse plate and the vertical plate are integrally formed (the transverse plate and the vertical plate are integrally formed in a 3D printing manner or an injection molding manner, but not limited to the printing manner or the injection

molding manner), the transverse plate is of a groove structure with an open top end, the top end of the transverse plate is covered with a cover plate 373, a through hole 374 is formed in the middle portion of the cover plate 373, the range finder is fixed in the groove, the emitting end of the range finder corresponds to the through hole 374, the vertical plate is of a trapezoidal structure with a narrow top and a wide bottom, a tapered through groove matched with the vertical plate in shape is formed in one side end of the fixing base 371, the detachable base 372 is clamped in the through groove through the vertical plate, and the range finder is configured to detect displacement information of goods in the corresponding goods channel. A prompting lamp 321 is installed at the outer side end of each goods channel 32, a scanner is disposed on the interactive interface 11, the prompting lamps 321 and the scanner are electrically connected to the main controller, the prompting lamps 321 are configured to prompt whether goods replenishment is needed, and the scanner is configured to scan bar code information of the goods or two-dimensional code information on the mobile phone.

The sales service personnel manage the goods condition in the vending machine through a sales service module, when goods replenishment or replacement is completed, the material trays are pushed to the original positions, the limit switches are triggered, the range finders emit infrared ray, ultrasonic wave or laser to reach the nearest goods, and the reflected signal is used for distance measurement, measured distance data are fed back to a cloud big data processing module, the quantity of actually placed goods on each goods channel can be obtained by setting the original distances of different goods, the quantity of actually placed goods is compared with data input when the sales service personnel replenish goods, when the data are consistent, no alarm is given, otherwise, alarm information is given in service APP of the sales service personnel, and the sales service personnel make comparison again in order to ensure that the quantity of goods put in does not have the problem. The range finder is fixed on the inner side end of the baffle through the range finder base, the range finder base includes the fixing base and the detachable base clamped with the fixing base, the range finder is installed in the detachable base, and when the range finder breaks down, the range finder base is conveniently dismounted for maintenance

or replacement.

Referring to FIG. 7, the cloud control lock system includes an electric lock, a magnetic card recognition region 41 disposed in the electric lock, and a lock control system disposed in the electric lock. The magnetic card recognition region 41 matches with a magnetic card 42 (the magnetic card is carried by the sales service personnel or the technicians). The lock control system includes a third controller 43, a clock chip 44, a motor 45, a magnetic control switch 46, and a storage module 47. The clock chip 44, the motor 45, the magnetic control switch 46, and the storage module 47 are all electrically connected to the third controller 43. The third controller 43 is electrically connected to the main controller. The clock chip 44 is configured to set unlocking time. The motor 45 is configured to drive a spring bolt of the electric lock to be opened or closed. The magnetic control switch 46 is configured to control the magnetic card recognition region 42 to be opened or closed. The storage module 47 is configured to store a preset unlocking time threshold value. The cloud control lock system is installed at the box doors of the refrigeration or normal-temperature region 21 and the freezing box body 22. The box doors are controlled to be opened or closed through the cloud control lock system. The sales service personnel or technicians carry out read-write operation on the magnetic card through a computer end and a magnetic card reader-writer, so as to update data in the magnetic card and send the updated data to the cloud control lock system through WIFI wireless communication, the data are stored through a memory (the stored data information includes the unlocking time threshold value, identity information of the sales service personnel or the technicians, and the like), the sales service personnel or the technicians can carry out card swiping operation only within specified time. When the magnetic card is placed corresponding to the magnetic card recognition region, the third controller compares information sent from the magnetic card with the information stored in the storage module, and when the authority and the time are confirmed to pass, the third controller sends an instruction to control the motor 45 to be started, the motor drives the spring bolt to be opened, unlocking of the cloud control lock system is achieved, and the sales service personnel or the technicians who have a mechanical key also can carry out manual unlocking through a hand switch on the electric lock.

In this embodiment, the sales service personnel or the technicians can also use a Bluetooth transmission mode to automatically unlock the cloud control lock system. A mobile phone of the sales service personnel or the technicians with the unlocking authority is equipped with a Bluetooth signal emitting apparatus, and a Bluetooth receiving apparatus matched with mobile phone Bluetooth is installed in the cloud control lock system. When the sales service personnel or the technicians carry out goods replenishment or device maintenance within a specified time, only the mobile phone Bluetooth needs to be turned on. When the Bluetooth signal is within the receiving range of the Bluetooth receiving apparatus of the cloud control lock system, pairing is successful, the mobile phone automatically sends authority information and time information of the sales service personnel or the technicians to the cloud control lock system, the authority information and the time information are compared with the information stored in the storage module in advance, and after the authority and the time are confirmed, the third controller sends an instruction to control the motor 45 to be started, and the motor drives the spring bolt to be opened, so that unlocking of the cloud control lock system is achieved. When the sales service personnel or the technicians carry out goods allocation or device maintenance, the opening operation of the cloud control lock system can be realized by one of the modes of magnetic card swiping, manual unlocking by the mechanical key or mobile phone Bluetooth communication, and the operation is convenient and fast.

The sales service personnel or the technicians can carry out on-off control on the lock on the vending machine apparatus with the authority through the mobile phone Bluetooth or the magnetic card, and when the personnel leave the work or a recognition apparatus or the magnetic card is lost, the authority is deleted through a computer terminal, so that the situation that a person without the authority randomly switches on and off the vending machine apparatus due to the above conditions is prevented, and unnecessary loss is reduced.

Referring to FIG. 9, the cabinet body further includes a falling detection apparatus, the falling detection apparatus includes a light source emitter 81 and a light source receiver 82, the light source emitter 81 is configured to send infrared light or laser, the light source receiver 82 is configured to receive the infrared light or laser sent by the

light source emitter 81, and the infrared light or the laser is sent in a single-point mode or a multi-point mode. The light source receiver 82 includes a plurality of receiving points, a distance between two adjacent receiving points is set according to a size of an article to be detected, the distance between two adjacent receiving points is smaller than the minimum width or diameter of the article to be detected, for example, when the minimum size of the article to be detected is 2 cm, the installation distance between two adjacent receiving points is not more than 1.5 cm, and when the minimum size of the article to be detected is 8 cm, the distance between two adjacent receiving points is less than or equal to 8 cm. The light source emitter 81 and the light source receiver 82 are electrically connected to the main controller; (in this embodiment, when the light source emitter 81 adopts single-point emission, the following structure may be adopted: the light source emitter 81 includes an optical fiber sensor, an optical fiber amplifier, an optical fiber, and a lens, the optical fiber sensor is connected to one end of the optical fiber amplifier, the optical fiber amplifier and the lens are respectively installed at two ends of the optical fiber, the lens is a scattering lens having an amplifying function, and a light source emitted by the optical fiber sensor is sequentially amplified by the optical fiber amplifier, transmitted by the optical fiber, and scattered by the lens, and then emitted in a fan shape). In this embodiment, the falling detection apparatus further includes a light source reflecting plate 83 having a light refraction function (the light source reflecting plate is a plane mirror having a light refraction function, but is not limited to a plane mirror), the light source emitter and the light source receiver are installed at the other end of the goods conveying belt side by side, the light source reflecting plate is installed at one end of the goods conveying belt 7, and the light source reflecting plate 83 corresponds to the emitting end of the light source emitter and the receiving end of the light source receiver, referring to FIG. 9, the light source emitted by the light source emitter 81 is reflected by the reflecting plate 83 and then returns to the light source receiver 82, and the light source emitted by the light source emitter is a conical light curtain.

The goods will trigger the falling detection apparatus installed at two ends of the goods conveying belt 7 (or a first goods conveying belt) in the process of falling onto the goods conveying belt 7, the light source receiver in the falling detection apparatus

is triggered to send a signal to the main controller, the main controller controls the goods conveying belt 7 (or a first goods conveying belt) to start and convey the goods to a goods outlet, and when the light source emitter is a multi-point light source, the distance between two adjacent point light sources is less than or equal to 1 cm (or the light source sent by the light source emitter in the falling detection apparatus is the light curtain), so that the problem of missed detection when the goods fall down is prevented.

Referring to FIG. 10, the cabinet body further includes a bag discharging system 9, the bag discharging system 9 is disposed at the front end of the cabinet body 1, the bag discharging system 9 includes a rolled bag mounting frame 91, a scroll 92 rotatably installed on the rolled bag mounting frame 91, a rolled bag 93 wound on the scroll 92, a bag pressing mechanism 94 and rolled bag supporting rods 95, and a photoelectric switch is disposed at the top end of the rolled bag mounting frame 91 and one side of the scroll 92 and configured to detect whether the rolled bag 93 is discharged or not. The bag pressing mechanism 94 includes a support frame 940, and an upper bag pressing mechanism and a lower bag pressing mechanism which are installed on the support frame 940. The rolled bag support rods 95 include a first rolled bag support rod 951, a second rolled bag support rod 952 and a third rolled bag support rod 953 which are distributed in sequence, one end of the rolled bag 93 is wound on the scroll 92, and the other end of the rolled bag 93 is wound on the first rolled bag support rod 951, the second rolled bag support rod 952 and the third rolled bag support rod 953 in sequence. The upper bag pressing mechanism includes an upper pressing plate 941 and tension springs 950 for driving the upper pressing plate to press. The lower bag pressing mechanism includes a lower pressing plate 942 and a first electric push rod 943 for driving the lower pressing plate 942 to press. The photoelectric switch 96 and the first electric push rod 943 are electrically connected to a second controller. The first electric push rod 943 is fixed on the support frame 940, the top end of the lower pressing plate 942 is fixed with a push rod of the first electric push rod 943, the bottom end of the lower pressing plate corresponds to the second rolled bag support rod 952, the rolled bag 93 is located between the lower pressing plate 942 and the second rolled bag support rod 952, one end of the upper pressing

plate 941 is hinged with the support frame 940, one end of the tension springs 950 are fixed with two side ends of the upper pressing plate 941, the other end of the tension springs are fixed at the top end of the lower pressing plate 942, and the bottom end of the upper pressing plate 941 is pressed against the top end of the rolled bag 93 by pulling of the tension springs 950.

When one consumer needs to use a bag, the bag is unfolded by pulling, when a through hole between two adjacent bags wound on the scroll 92 passes through the photoelectric switch, the photoelectric switch is triggered and sends a signal to the second controller, the second controller controls the first electric push rod to push the lower pressing plate to press down, the bag is pressed between the lower pressing plate and the second rolled bag supporting rod, and the situation that a plurality of bags are pulled out due to too much force when the bag is pulled is prevented. The upper pressing plate 941 in the upper bag pressing mechanism always abuts against the top end of the rolled bag under the elastic action of the tension springs, so that the situation that the rolled bag is forced to be loose due to inertia generated by too much force when the bag is pulled is prevented.

Referring to FIG. 12, the storage cabinet system 6 is disposed at one side of the cabinet body 1, and includes at least two storage cabinets 61 (four storage cabinets in this embodiment), temperature sensors installed in the storage cabinets 61, and cabinet doors 62 installed on the storage cabinets 61. One side ends of the cabinet doors 62 are hinged with the storage cabinets 61, the temperature sensors are configured to collect temperature information in the storage cabinets 61, the storage cabinets 61 are communicated with the freezing box body through pipelines, electric control locks are installed on the cabinet doors 62, solenoid valves and fans are installed in the pipelines, the temperature sensors, the solenoid valves and the electric control locks are electrically connected to a fourth controller, and the fourth controller is electrically connected to the main controller. When the consumer needs to store the goods through the storage cabinet system 6, the needed storage cabinet is selected through consumption APP, the mobile phone sends a solenoid valve opening signal to the main controller, the main controller sends the signal to the fourth controller, the fourth controller controls the electric control lock to be opened, the consumer puts

into an article that needs to be stored and closes the cabinet door, then the temperature for storage is selected through the consumption APP, the fourth controller controls the opening degree of the solenoid valve and the rotational speed of the fan, and cold air in the freezing box body is sucked into the cabinet body through the fan, so that the intelligent regulation of temperature in the storage cabinet is achieved. The storage cabinet system can carry out intelligent regulation to the temperature in the storage cabinets according to the temperature selected by the consumer, and is further convenient to use for the consumer, and the temperature control range of the storage cabinet system is minus ten degrees centigrade to room temperature in this embodiment.

Referring to FIG. 3, in Embodiment II, the structure of a vending machine apparatus in this embodiment is similar to that of the vending machine apparatus in Embodiment I, and the difference therebetween is that: in this embodiment, interactive interfaces 11, bag discharging systems 9 and goods outlets 31 of the vending machine apparatus include two groups, and the two groups of interactive interfaces 11, bag discharging systems 9 and goods outlets 31 are respectively located at two side ends of a goods conveying belt 7. The interactive interface 11, the bag discharging system 9 and the goods outlet in each group are distributed from top to bottom in sequence. In this embodiment, a light source emitter 81 and a light source receiver 82 are respectively installed at two side ends of the goods conveying belt 7, and the light source emitter 81 and the light source receiver 82 are distributed correspondingly.

Referring to FIG. 4, in Embodiment III, the structure of a vending machine apparatus in this embodiment is similar to that of the vending machine apparatus in Embodiment II, and the difference therebetween is that: in this embodiment, a storage cabinet system is not disposed, and two goods conveying belts are disposed and include: a first goods conveying belt 71, and a second goods conveying belt 72 perpendicular to the first goods conveying belt 71, where the first goods conveying belt 71 is located between a refrigeration or normal-temperature region 21 and a freezing box body 22, goods outlet ends of conveying apparatuses in the refrigeration or normal-temperature region 21 and the freezing box body 22 are located above the

first goods conveying belt 71, a light source emitter 81 and a light source receiver 82 in this embodiment are respectively installed at two side ends of the first goods conveying belt 71, interactive interfaces 11, bag discharging systems 9, and good outlets 31 include two groups, and the two groups of interactive interfaces 11, bag discharging systems 9, and good outlets 31 are located at two side ends of the second goods conveying belt 72 respectively.

Referring to FIG. 13, in Embodiment IV, the structure of a vending machine apparatus in this embodiment is similar to that of the vending machine apparatus in Embodiment I, and the difference therebetween is that: in this embodiment, a plurality of box doors are disposed at the outlet end of a freezing box body 22, no box door is disposed in the refrigeration or normal-temperature region 21, and the temperature of the refrigeration or normal-temperature region 21 is the same as the temperature inside a cabinet body 1.

A vending machine management system applied to the above Embodiment I to Embodiment IV is provided. The management system includes an application terminal and a management platform. The application terminal includes a consumer module 101, a sales service module 102, a technician module 103, an investor module 104 and a special group module 105. The consumer module 101, the sales service module 102, the technician module 103, the investor module 104 and the special group module 105 are all realized on the basis of a vending machine apparatus and a terminal device. The terminal device is a mobile phone in this embodiment, consumption APP used by consumers, service APP used by sales service personnel, technology APP used by technicians, investment APP used by investors and subsidy APP used by a special group are installed in the mobile phone, and the mobile phone is in communication connection with the management platform through Wifi or 4G/5G communication.

The consumer module 101 refers to that consumers select, purchase or store goods in the vending machine apparatus through the mobile phone or an interactive interface. The sales service module 102 refers to that sales service personnel increase, decrease or replace goods of the vending machine apparatus at a specified place and in a specified time through big data information of the mobile phone. The sales service

personnel include goods replenishment/transfer personnel, storage personnel and material allocation personnel. The technician module 103 refers to that technicians maintain or repair goods in the vending machine apparatus at a specified place through the information of the mobile phone. The technicians include repair/maintenance personnel. The investor module 104 refers to that an investor knows sale, inventory, profit and position information of the vending machine apparatus invested by the investor through the mobile phone, and sends an automatic checking instruction through the mobile phone so as to obtain the latest sale or inventory data of the corresponding vending machine apparatus. The special group module 105 refers to that a group with special requirements selects, purchases or stores goods in the vending machine apparatus through the terminal device or the interactive interface of the vending machine apparatus.

The management platform includes a GPS positioning apparatus and an authority module, where the GPS positioning apparatus is configured to position specific position information of the vending machine apparatus and send the position information to the mobile phone; and the authority module 106 includes an identity recognition unit, a face recognition unit, and a fingerprint recognition unit, the identity recognition unit is configured to recognize identity information of the consumers and the special group, and the face recognition unit is configured to collect and recognize face information of the special group. When the consumers buy restricted commodities, identity recognition is carried out through the identity recognition unit and the face recognition unit. For example, when buying cigarettes and alcohol, the consumer who buys cigarettes and alcohol need to verify an identity card through the identity recognition unit and the face recognition unit, and purchases and gets goods in the specified time. The personnel that accord with the age can get into consumption APP and carry out the commodity purchase in the specified time, that is, the personnel who buy cigarettes and alcohol need at first carry out real name authentication, when getting goods after the personnel passing real name authentication purchase the goods, the personnel need to carry out face recognition and identity card recognition in front of the corresponding vending machine apparatus, and after passing dual verification of face recognition and identity card

recognition, the purchasing personnel just can get the goods, which avoids underage consumers to get cigarettes and alcohol.

The management platform further includes a goods selection unit, a payment unit, a login unit, a registration unit, a storage management unit, a cloud control lock unit, a cloud delivery unit, and a registration unit. The goods selection unit provides a list of products to be sold and is configured to select and manage the goods. The payment unit is used for payment management. The login unit is configured to provide a login port. The registration unit is configured to register new product information. The storage management unit is configured to carry out access management on the purchased goods. The cloud control lock unit is configured to control a lock of the vending machine apparatus, includes an unlocking authority, and sets that a specified person has the authority to unlock the lock at a specified position within a specified time through the unlocking authority. The cloud delivery unit is used for delivery management. After the consumers or the special group pay the goods, the quantity of goods purchased by the consumers may be deducted from an inventory in the corresponding vending machine apparatus. If actual delivery is not generated after the consumers pay the goods, the goods may be automatically returned to the inventory for secondary sale, specifically including: when the consumers purchase the goods on the vending machine apparatus by using the consumption APP on the mobile phone and cannot pick the goods immediately, a cloud big database carries out cloud delivery processing, and the goods may be deducted for a period of time from the inventory of the vending machine apparatus. If the consumers finish picking the goods by using a password or scanning a two-dimensional code of the mobile phone within a specified time, the cloud big database carries out delivery data processing, and if the consumers do not finish picking the goods within the specified time, the data of the purchased goods returns to the vending machine apparatus for secondary sale, and the payment of the goods of the consumers is returned. The product list includes categories of products, discount products and preferred products. The registration unit is configured to register new product information.

When purchasing the goods, the consumers log in the consumption APP through a consumer login unit on the mobile phone to select or purchase the goods in the

vending machine or through the interactive interface. After confirming the collection through the consumption APP or a payment apparatus (two-dimensional code scanning payment or a cash payment port) on the cabinet body, the goods in the corresponding storage system 2 is controlled by the main controller in the vending machine to be pushed by the crawler-type conveying belts or the spiral push rods to drop on the goods conveying belt 7, the goods conveying belt 7 automatically conveys the goods to the goods outlet, and the consumers pick the purchased goods through the goods outlet. When plastic bags are needed, the consumers can take the plastic bags through the bag discharging system 9 on the cabinet body. The consumers can also walk to the vending machine to input a password or scan a two-dimensional code to carry out the above delivery procedure by generating the password or the two-dimensional code through the consumption APP.

The sales service personnel log in the service APP through a service personnel login unit on the mobile phone to replenish or exchange the goods in the vending machine apparatus, and the service personnel login unit includes a goods replenishment/transfer personnel login interface and a material allocation personnel login interface. The sales service personnel can autonomously register new products through the registration unit. The investment APP may check the quantity of replenished or exchanged goods filled by the sales service personnel in real time through an automatic checking apparatus in the vending machine apparatus during each replenishment or exchanging process, and if the quantity is wrong, early warning information is immediately sent to the mobile phone to remind the sales service personnel to correct the quantity.

The outlet end of each goods channel is provided with the prompting lamp, and the prompting lamps are configured for replenishment prompt. When the sales service personnel need to replenish the goods, the scanner on the interactive interface is used to scan a two-dimensional code or bar code on the goods. After the system confirms that the goods need replenishing, the main controller controls the prompting lamp at the corresponding position to light up, so that the sales service personnel can conveniently and quickly find the position of the goods needing replenishing, and the trouble caused by the misplacement of proximate items is prevented. After the goods

replenishment is accomplished, the sales service personnel move back the material tray to the original position, the limit switch is triggered, and when the range finder detects that the quantity of the goods on the goods channel is correct, the main controller sends a signal to the prompting lamp and controls the prompting lamp to be extinguished, thereby accomplishing the replenishment. The sales service personnel can also scan and recognize the two-dimensional code or the bar code of the goods through a camera of the mobile phone, and send a scanning signal to the main controller of the vending machine apparatus through WiFi communication or 4G/5G communication or other modes, and the main controller controls the prompting lamp at the outer side end of the goods channel for placing corresponding goods to light up, so that the same prompting effect can be achieved.

The technicians can repair, maintain and carry out daily patrol and punch clock operation to the braking vending machine apparatus through an instruction received on the technology APP on the mobile phone, and when the vending machine needs to be debugged after the maintenance, the technicians can carry out real-time test on the maintained vending machine through the simulated delivery and replenishment function of the technology APP simultaneously to ensure the normal operation of the maintained vending machine.

The investors log in the investment APP through an investor login unit on the mobile phone, know a series of data such as inventory, sales and profit of the vending machine under the name of the investor in real time, send a goods exchange instruction to goods not well sold in a specified vending machine apparatus through the investment APP, and meanwhile set the authority of the corresponding vending machine apparatus through the APP.

The special group includes persons disabled in action, subsidized personnel, volunteer personnel and the like. When purchasing the goods, the special group logs in the subsidy APP through a subsidized personnel login unit on the mobile phone, the subsidized personnel need to be determined by related departments, so the subsidy APP can be downloaded and installed after the identity recognition is firstly carried out through the identity recognition unit. When logging in through the subsidized personnel login unit, the subsidized personnel can enter the subsidy APP for goods

selection after being verified through the face recognition unit, and goods to be sold displayed in the subsidy APP are generally quota of the related departments. For example, the special group is verified through the face recognition unit and the identity recognition unit on the vending machine apparatus, and then purchases cigarettes on the vending machine apparatus, and can also purchase alcohol in a specified time. The subsidy APP includes a one-key help-seeking unit. The subsidized personnel disabled in action can seek help through the one-key help-seeking unit. The volunteer personnel can log in the subsidy APP to process help-seeking information of the subsidized personnel disabled in action. Both the volunteer personnel and the recipients of assistance are required to click to confirm delivery and its completion. Once the delivery is completed, the system records the friendly actions, providing evidence for subsequent processing such as later awards. Therefore, the above management system is convenient for the consumers, the subsidized personnel and the volunteer personnel to use and also convenient for the service personnel to use, so that the use convenience is greatly improved.

The above are only preferred implementations of this application, and the present invention is not limited to the above embodiments. It is to be understood that other modifications and variations directly derived or suggested to those skilled in the art without departing from the spirit and scope of the present invention are to be considered as included within the scope of the present invention.

CLAIMS

1. An integrated vending machine management system, comprising an application terminal and a management platform, wherein the application terminal comprises a consumer module, a sales service module and a technician module, and the consumer module, the sales service module, and an investor module are realized on the basis of a vending machine apparatus and a terminal device; the management system comprises a big data processing module; the terminal device comprises a mobile terminal and a computer terminal; the application terminal further comprises a special group module and the investor module; the consumer module refers to that consumers select, purchase or store goods in the vending machine apparatus through the terminal device or an interactive interface of the vending machine apparatus; the sales service module refers to that sales service personnel increase, decrease or replace goods in the vending machine apparatus at a specified place and in a specified time through big data information of the terminal device; the technician module refers to that technicians maintain or repair the vending machine apparatus at a specified place through the information of the terminal device; the investor module refers to that an investor knows sale, inventory, profit and position information of the vending machine apparatus invested by the investor through the terminal device, and sends an automatic checking instruction through the terminal device so as to obtain the latest sale or inventory data of the corresponding vending machine apparatus; the special group module refers to that a group with special requirements selects, purchases or stores goods in the vending machine apparatus through the terminal device or the interactive interface of the vending machine apparatus; the management platform further comprises a positioning module, and the positioning module is configured to position specific position information of the vending machine apparatus and send the position information to the terminal device; and the big data processing module refers to storing or processing data generated by the vending machine apparatus or data generated by the terminal device.
2. The integrated vending machine management system according to claim 1, wherein the management platform further comprises an authority module, the authority module comprises an identity recognition unit, a face recognition unit and a

fingerprint recognition unit, the identity recognition unit is configured to recognize identity information of the consumers and the special group, and the face recognition unit is configured to collect and recognize face information of the special group.

3. The integrated vending machine management system according to claim 2, wherein the terminal device comprises a mobile phone and/or a computer, consumption APP used by the consumers, service APP used by the sales service personnel, technology APP used by the technicians, investment APP used by the investors and subsidy APP used by the special group are installed in the mobile phone and/or the computer, and the mobile phone and/or the computer are in communication connection with the management platform through a communication module.

4. The integrated vending machine management system according to claim 3, wherein the management platform further comprises a goods selection unit, a payment unit, a login unit, a registration unit, a storage management unit, a cloud control lock unit, and a cloud delivery unit; the goods selection unit provides a list of products to be sold and is configured to select and manage the goods; the payment unit is used for payment management; the login unit is configured to provide a login port; the registration unit is configured to register new product information; the storage management unit is configured to carry out access management on the purchased goods; the cloud control lock unit is configured to control a lock of the vending machine apparatus, comprises an unlocking authority, and sets that a specified person has the authority to unlock the lock at a specified position within a specified time through the unlocking authority; and the cloud delivery unit is used for delivery management, after the consumers or the special group pay the goods, the quantity of goods purchased by the consumers may be deducted from inventory data in the corresponding vending machine apparatus; and if actual delivery is not generated after the consumers pay the goods, the goods may be automatically returned to the inventory data for secondary sale.

5. An integrated vending machine apparatus, wherein the vending machine apparatus adopts the vending machine management system according to any one of claims 1-4, and comprises a cabinet body, a main controller and a communication module; the main controller is in communication connection with the terminal device through the

communication module; a storage system, a conveying system, and a cloud control lock system are disposed in the cabinet body; an interactive interface and a goods outlet are disposed at a front end of the cabinet body, and the interactive interface, the storage system, the conveying system and the cloud control lock system are electrically connected to the main controller; the storage system is configured to store goods; the conveying system is configured to convey goods; and the cloud control lock system is configured to control a lock.

6. The integrated vending machine apparatus according to claim 5, wherein the storage system comprises a refrigeration or normal-temperature region and a freezing box body which are disposed in the cabinet body, a refrigeration refrigerating apparatus is disposed in the refrigeration or normal-temperature region and is configured to carry out refrigeration or normal-temperature storage of the goods, the freezing box body comprises a freezing refrigerating apparatus configured to freeze and store the goods, and the refrigeration refrigerating apparatus and the freezing refrigerating apparatus are electrically connected to the main controller; and an outlet end of the freezing box body is provided with a plurality of box doors, top ends of the box doors are hinged with the freezing box body, two ends of each box door are respectively provided with second electric push rods, one end of each second electric push rod is hinged with a side end of the corresponding box door, the other end of each second electric push rod is hinged with a side end of the freezing box body, and the second electric push rods are electrically connected to the main controller.

7. The integrated vending machine apparatus according to claim 6, wherein the conveying system comprises a plurality of layers of material trays distributed side by side, a plurality of goods channels disposed on each layer of material trays and distributed side by side, spiral push rods or crawler-type conveying belts disposed on the goods channels, and a goods conveying belt disposed below outer side ends of the goods channels, the goods outlet is located at one end of the goods conveying belt, the material trays are slidably installed in the refrigeration or normal-temperature region and the freezing box body through guide rail structures, a baffle is disposed at an inner side end of each goods channel, an inventory counter is fixed on each baffle and configured to detect position or quantity information of goods on the goods channel,

the inventory counters are electrically connected to a first controller, and the first controller is electrically connected to the main controller.

8. The integrated vending machine apparatus according to claim 7, wherein each inventory counter comprises a range finder and a limit switch, the range finder and the limit switch are both electrically connected to the first controller, and the limit switch is fixed on one side of a guide rail, corresponds to an inner side end of the material tray; and the range finder is fixed in a middle portion of the baffle through a range finder base, the range finder base comprises a fixing base and a detachable base clamped with the fixing base, the detachable base comprises a T-shaped plate, the T-shaped plate comprises a transverse plate and a vertical plate vertically fixed to a bottom end of the transverse plate, the transverse plate and the vertical plate are integrally formed, the transverse plate is of a groove structure with an open top end, the top end of the transverse plate is covered with a cover plate, a through hole is formed in a middle portion of the cover plate, the range finder is fixed in the groove, an emitting end of the range finder corresponds to the through hole, the vertical plate is of a trapezoidal structure with a narrow top and a wide bottom, a tapered through groove matched with the vertical plate in shape is formed in one side end of the fixing base, the detachable base is clamped in the through groove through the vertical plate, and the range finder is configured to detect position information of the goods in the goods channel.

9. The integrated vending machine apparatus according to claim 8, wherein the cabinet body further comprises a falling detection apparatus installed on the conveying system, the falling detection apparatus comprises a light source emitter and a light source receiver, the light source emitter is configured to send infrared light or laser, the light source receiver is configured to receive the infrared light or the laser sent by the light source emitter, the infrared light or the laser is sent in a single-point mode or a multi-point mode, and the light source emitter and the light source receiver are both electrically connected to the main controller.

10. The integrated vending machine apparatus according to claim 9, wherein the light source emitter and the light source receiver are correspondingly installed at both side ends of the goods conveying belt.

11. The integrated vending machine apparatus according to claim 9, further comprising a light source reflecting plate, wherein the light source emitter and the light source receiver are disposed at the other end of the goods conveying belt side by side, the light source reflecting plate is disposed at one end of the goods conveying belt, and the light source reflecting plate corresponds to an emitting end of the light source emitter and a receiving end of the light source receiver.

12. The integrated vending machine apparatus according to claim 10 or 11, wherein a prompting lamp is installed at an outer side end of each goods channel, a scanner is disposed on the interactive interface, the prompting lamps and the scanner are electrically connected to the main controller, the prompting lamps are configured to prompt a position needing goods replenishment, and the scanner is configured to scan bar code information of the goods or two-dimensional code information in a mobile terminal.

13. The integrated vending machine apparatus according to claim 12, wherein a bag discharging system is disposed in the cabinet body, the bag discharging system is disposed at a front end of the cabinet body and comprises a rolled bag mounting frame, a scroll rotatably installed on the rolled bag mounting frame, a rolled bag wound on the scroll, a bag pressing mechanism and rolled bag supporting rods, the rolled bag supporting rods are configured to support the rolled bag, and the bag pressing mechanism is configured to press the rolled bag.

14. The integrated vending machine apparatus according to claim 13, wherein the cloud control lock system comprises an electric lock, a magnetic card recognition region disposed in the electric lock, and a lock control system disposed in the electric lock, the magnetic card recognition region is matched with a magnetic card, the lock control system comprises a third controller, a clock chip, a motor and a storage module, the clock chip, the motor and the storage module are all electrically connected to the third controller, the third controller is electrically connected to the main controller, the clock chip is configured to set unlocking time, the motor is configured to drive a spring bolt of the electric lock to be opened or closed, and the storage module is configured to store a preset unlocking time threshold value.

15. The integrated vending machine apparatus according to claim 7 or 14, wherein

two goods conveying belts are disposed and comprise: a first goods conveying belt and a second goods conveying belt, the first goods conveying belt and the second goods conveying belt are perpendicularly distributed, the first goods conveying belt is located between the refrigeration or normal-temperature region and the freezing box body, a goods outlet end of the conveying system in the refrigeration or normal-temperature region and the freezing box body is located above the first goods conveying belt, and the light source emitter and the light source receiver are respectively installed at two side ends of the first goods conveying belt; and the interactive interfaces, the bag discharging systems and the goods outlets comprise two groups, and the two groups of interactive interfaces, bag discharging systems and goods outlets are respectively located at two side ends of the second goods conveying belt.

16. The integrated vending machine apparatus according to claim 15, wherein the cabinet body is internally provided with a storage cabinet system, the storage cabinet system is configured to store goods, the storage cabinet system comprises a plurality of storage cabinets, temperature sensors installed in the storage cabinets, and cabinet doors installed on the storage cabinets, the temperature sensors are configured to collect temperature information in the storage cabinets, the storage cabinets are communicated with the freezing box body through pipelines, solenoid valves and fans are installed in the pipelines, the temperature sensors and the solenoid valves are electrically connected to a fourth controller, and the fourth controller is electrically connected to the main controller.