

LOCK DEVICE OF VENDING MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001]

The present invention relates to a lock device of a vending machine, and more particular, to a lock device of a vending machine, in which a lock member arranged on one of a body of the vending machine and a door body and a slider arranged on the other thereof engage with each other whereby a state, in which the door body closes a front opening of the body of the vending machine, is held while engagement between the lock member and the slider is released whereby the door body openingly moves to permit the front opening of the body of the vending machine to be opened.

2. Description of the Related Art

[0002]

Generally, vending machines comprise a body of the vending machine being rectangular-shaped with a front thereof opened and receiving therein commodities, and a door body arranged to be able to open and close the front opening of the body of the vending machine. The door body is formed with a rectangular-shaped opening and arranges thereon a slider to enable the same to slide between a lock position and a release position in a vertical direction. When being held in the

release position by a slider holding member, the slider permits a lock member, which comprises hook-shaped metal fittings provided on the body of the vending machine, to enter the rectangular-shaped opening thereof but does not engage with the lock member. Therefore, the front opening of the body of the vending machine is opened by openingly moving the door body, so that replenishment of commodities, or the like is enabled.

[0003]

On the other hand, by closingly moving the door body to close the front opening of the body of the vending machine, the lock member enters the rectangular-shaped opening of the slider held in the release position by the slider holding member and the lock member pushes the slider holding member down whereby holding by the slider holding member is released and the slider is moved to the lock position from the release position by a weight thereof. Thereby, an upper edge of the rectangular-shaped opening of the slider and the lock member abut against each other and the slider engages with the lock member. In this manner, the slider and the lock member engage with each other whereby a state, in which the door body closes the front opening of of the body of the vending machine, is held.

[0004]

The slider is formed with a rectangular-shaped hole, the rectangular-shaped hole having a rod (a thin column portion)

of a cylinder lever inserted therethrough. The cylinder lever moves unlockingly about an axis thereof according to the unlocking operation of a key inserted into a key insertion port disposed in the front side of the door body and moves lockingly about the axis thereof according to the locking operation of the key. With the slider, the cylinder lever moves unlockingly to cause a rod to abut against an upper edge of the rectangular-shaped hole to move to the release position from the lock position while the cylinder lever moves lockingly to cause the rod to abut against a lower edge of the rectangular-shaped hole to move to the lock position from the release position.

[0005]

Therefore, in the case where a state, in which the door body closes the front opening of of the body of the vending machine, is held, that is, the slider and the lock member engage with each other, the key inserted into the key insertion port is unlockingly operated whereby the cylinder lever moves unlockingly and the slider is moved thereby to the release position from the lock position. The slider having been moved the release position is held by the slider holding member. In this manner, when the slider is held in the release position, engagement thereof with the lock member is released and the front opening of the body of the vending machine can be opened by openingly moving the door body (see, for example,

JP-A-2002-342827).

[0007]

By the way, it is general that a routeman who carries out replenishment of commodities, maintenance, etc. inserts a key into a key insertion port. Also, in case of inserting a key into a key insertion port to perform an unlocking operation, the key cannot be pulled out in such a state of unlocking operation and the key cannot be pulled out from the key insertion port unless a locking operation is again performed to bring about a state of locking operation. Further, it is general that a routeman mounts the key to, for example, a belt loop of clothes, etc. by means of an exclusive mount member or the like together with keys of other vending machines to hold the same.

[0008]

Therefore, a routeman first inserts a key into a key insertion port to perform an unlocking operation for the sake of replenishment of commodities. Thereby, a slider is moved to a release position from a lock position through a cylinder lever and so engagement thereof with a lock member is released. Thereby, while a front opening of a body of the vending machine can be opened by openingly moving a door body, it is necessary to pull out the key from the key insertion port for replenishment of commodities and therefore, the key is lockingly operated to be pulled out from the key insertion port

since the key is mounted to routeman's clothes by means of the mount member or the like. In this manner, since the locking operation is performed in order to pull out the key from the key insertion port, the slider is moved to the lock position from the release position through the cylinder lever. After replenishment of commodities or the like is carried out, it is necessary to closingly move the door body to close the front opening of the body of the vending machine, but the locking operation is performed in order to pull out the key from the key insertion port and so the slider is moved to the lock position. Therefore, since the lock member cannot enter a rectangular-shaped opening of the slider in this state even when the door body is closingly moved, it is required that a routeman insert the key again into the key insertion port to perform an unlocking operation to move the slider to the release position from the lock position and closingly move the door body in this state to close the front opening of the body of the vending machine to engage the slider with the lock member to pull out the key from the key insertion port.

[0009]

In carrying out replenishment of commodities or the like, in order to closingly move the door body to close the front opening of the body of the vending machine after the door body is openingly moved to open the front opening of the body of the vending machine, it is necessary to insert the key again

into the key insertion port to perform an unlocking operation, thus making the work such as replenishment of commodities, etc. complex. Also, apart from this, a lock device that holds a state, in which the door body closes the front opening of the body of the vending machine, is demanded of an excellent burglerproof quality at all times.

SUMMARY OF THE INVENTION

[0010]

The invention has been thought of in view of the situation and has its object to provide a lock device of a vending machine, which enables favorably ensuring a burglerproof quality while making the work such as replenishment of commodities, etc. high in efficiency.

[0011]

In order to attain the object, a lock device of a vending machine, according to a first aspect of the invention, has a feature in a lock device of a vending machine comprising a body of the vending machine, which is rectangular-shaped with a front thereof opened and in which commodities are received, a lock member mounted to one of the body of the vending machine and a door body arranged to enable opening and closing the front opening, and a slider arranged on the other of the body of the vending machine and the door body to be movable between a lock position of being able to engage with the lock member and a

release position, in which engagement with the lock member is released, the lock member and the slider engaging with each other to hold a state, in which the door body closes the front opening of the body of the vending machine, and engagement of the lock member and the slider being released to permit the door body to openingly move to open the front opening of the body of the vending machine, and wherein the lock device of the vending machine comprises a cylinder lever moving lockingly and moving unlockingly about an axis thereof according to the locking operation and the unlocking operation of a key into a predetermined key insertion port, a connecting member arranged integrally with the slider and caused, in the case where the cylinder lever unlockingly moves, to abut against the cylinder lever to be displaced to move the slider to an unlock position from the lock position while, in the case where the cylinder lever lockingly moves, permitting the locking movement at all times, and a restriction member that normally restricts a displacement magnitude of the connecting member to inhibit the slider from moving to the release position from the lock position while permitting displacement of the connecting member in the case where the cylinder lever unlockingly moves.

[0012]

Also, the lock device of a vending machine, according to a second aspect of the invention, adds to the first aspect

described above a feature that the restriction member is arranged to be able to swing about an axis thereof between a position of restriction and a position of permission and restricts a displacement magnitude of the connecting member, when positioned in the position of restriction, to inhibit the slider from moving to the release position from the lock position while permitting displacement of the connecting member when positioned in the position of permission, the lock device comprising a guide member interposed between the cylinder lever and the restriction member to abut against the cylinder lever to swing the restriction member to the position of permission from the position of restriction in the case where the cylinder lever unlockingly moves.

[0013]

Also, the lock device of a vending machine, according to a third aspect of the invention, adds to the first or second aspect described above a feature of comprising a slider holding member that holds the slider in the release position in the case where the slider moves to the release position from the lock position, and releases holding of the slider to permit the slider to move to the lock position from the release position in the case where the lock member enters the slider positioned in the release position, and the slider is depressed by the lock member.

[0014]

According to the invention, since the connecting member arranged integrally on the slider is caused, in the case where the cylinder lever unlockingly moves, to abut against the cylinder lever to be displaced to move the slider to the unlock position from the lock position while, in the case where the cylinder lever lockingly moves, permitting the locking movement at all times, it is unnecessary to again insert the key into the key insertion port in case of closingly moving the door body after performing the work such as replenishment of commodities, etc. and so the work such as replenishment of commodities, etc. is not made complex. Also, since the restriction member normally restricts a displacement magnitude of the connecting member to inhibit the slider from moving to the release position from the lock position while permitting displacement of the connecting member in the case where the cylinder lever unlockingly moves, the burglerproof quality is ensured in the case where a state, in which the door body closes the front opening of the body of the vending machine, is held. Accordingly, there is produced an effect of enabling favorably ensuring a burglerproof quality while making the work such as replenishment of commodities, etc. high in efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a vending machine, to which a lock device

according to an embodiment of the invention is applied, and is a perspective view showing an internal construction;

Fig. 2 is a perspective view showing essential parts, which constitute the lock device, such as a slider arranged in an interior of a bag portion of an external door, shown in Fig. 1, etc.;

Fig. 3 is a perspective view schematically showing, in enlarged scale, the essential parts of the lock device shown in Fig. 2;

Fig. 4 is an exploded, perspective view schematically showing the slider shown in Fig. 2, as viewed from an opposite side to Figs. 2 and 3;

Fig. 5 is a plan view showing, in enlarged scale, the slider shown in Fig. 2, as viewed from above;

Fig. 6 is a perspective view schematically showing a part of the essential parts of the lock device shown in Fig. 3;

Fig. 7 is a perspective view schematically showing, in enlarged scale, the operation of the essential parts of the lock device shown in Fig. 2;

Fig. 8 is a perspective view schematically showing, in enlarged scale, the operation of the essential parts of the lock device shown in Fig. 2;

Fig. 9 is a perspective view schematically showing, in enlarged scale, the operation of the essential parts of the lock device shown in Fig. 2;

Fig. 10 is a perspective view schematically showing a part of the essential parts of the lock device shown in Fig. 9;

Fig. 11 is a perspective view schematically showing, in enlarged scale, the operation of the essential parts of the lock device shown in Fig. 2;

Fig. 12 is a perspective view schematically showing a part of the essential parts of the lock device shown in Fig. 11; and

Fig. 13 is a plan view showing the case where a tool is inserted in Fig. 5.

DETAILED DESCRIPTION OF THE INVENTION

[0016]

Referring appropriately to the accompanying drawings, a preferred embodiment of a lock device of a vending machine according to the invention will be described below in detail.

[0017]

Fig. 1 shows a vending machine, to which a lock device according to an embodiment of the invention is applied, and is a perspective view showing an internal construction. Here, the vending machine illustrated herein sells commodities, such as canned beverage, beverage packed in PET bottles, beverage packed in paper packs, etc. in a cooled or heated state, and comprises a body cabinet 1 being a body of the vending machine.

[0018]

The body cabinet 1 is rectangular-shaped with a front thereof opened and its interior is compartmented into two sections, an upper section of which defines a commodity storage housing 2 and a lower section of which defines a machine room 3. The commodity storage housing 2 comprises a chamber, an interior of which is maintained in a state of a preset temperature, and wall members, which define the commodity storage housing 2, respectively, are made of a heat insulating material. Also, while not shown clearly in the figure, there are provided cooling means for cooling of an internal atmosphere, such as an evaporator, which constitutes a refrigerating cycle, and heating means for heating of an internal atmosphere, such as electric heater, etc.

[0019]

While a detailed explanation therefor is omitted herein, commodity racks 4 and bucket moving means 5 are provided in the commodity storage housing 2. The commodity racks 4 are formed by aligning a plurality of commodity storage columns in a left and right direction, and can receive a plurality of commodities in a state of aligning them in a longitudinal direction in a commodity storage passage defined in each of the commodity storage columns. The commodity racks 4 are provided in plural stages in a vertical direction in a manner to bridge a pair of left and right rack support side plates

(not shown) mounted in the commodity storage housing 2. In addition, in the specification of the present application, an explanation will be given assuming that a left side indicates a leftward side in the case where the vending machine is seen from the front, and a right side indicates a rightward side in the case where it is desirable to see the vending machine from the front.

[0020]

The bucket moving means 5 comprises an assembly of a X-axis conveyance mechanism and Y-axis conveyance mechanisms. The X-axis conveyance mechanism comprises a rail member disposed in the body cabinet 1 and extending in a region forwardly of the commodity racks 4 in a left and right direction and is driven by a X-axis motor to move a bucket mounted thereon in a direction (a left and right direction), in which the rail member extends.

[0021]

The Y-axis conveyance mechanisms are provided on a pair of left and right conveyance and support frames. Pulleys are arranged rotatably in the vicinity of upper ends of the conveyance support frames. A length of belt in the form of a lengthy cable is stretched around the pulley, the belt being connected at one end thereof to a weight and connected at the other end thereof to a holding member, which holds the rail member. With the Y-axis conveyance mechanisms, a Y-axis motor

is driven to rotate the pulleys whereby the rail member held on the holding member and the X-axis conveyance mechanism mounting thereon the bucket are moved in a vertical direction.

[0022]

A refrigerator (compressor, condenser), which constitutes a refrigerating cycle together with the evaporator, and various control equipment, etc. are provided in the machine room 3.

[0023]

An internal door 10 and an external door (door body) 20 are provided on the front of the body cabinet 1. The internal door 10 is formed by fitting thereinto a transparent plate member such as insulating glass, etc. and is sufficiently large to cover the front of the commodity storage housing 2. In the case where the internal door 10 is to be moved in a closing manner to close the front of the commodity storage housing 2, it serves a heat insulating member that constitutes the front of the commodity storage housing 2.

[0024]

Formed in a region below and on the right of a central portion of the transparent plate member of the internal door 10 are a rectangular-shaped commodity carrying-out port 11 and a carrying-out flapper 12 that serves to open and close the commodity carrying-out port 11. The carrying-out flapper 12 is journaled with a lower end thereof made free to be able to

swing in a longitudinal direction and normally closes the commodity carrying-out port 11 owing to its weight.

[0025]

The external door 20 serves to open and close the front opening of the body cabinet 1 and has a window 21, which is made of a heat insulating material at need and formed by fitting thereinto a transparent plate member such as insulating glass, etc. Accordingly, the vending machine is of a view type, an interior of which can be visually recognized through the window 21 of the external door 20. Also, arranged on the front of the external door 20 are selection switches intended for selection of a sales commodity, and a money inlet slot for charging of money, etc., which elements are not clearly shown in the figure but necessary at the time of automatic vending of a commodity.

[0026]

A lock member R, which constitutes a lock device, and a slider 31 (see Fig. 2), respectively, are arranged on the body cabinet 1 and the external door 20. As shown in Fig. 1, the lock member R is arranged in a predetermined location at a right and front end of the body cabinet 1. The lock member R comprises metal fittings being conventionally known and in the form of a hook. The slider 31 is arranged in a bag portion 22 formed at an opened end of the external door 20. The reference numeral 23 in Fig. 1 denotes an opening of the bag

portion 22 formed in the same level as that of the lock member R to permit entry of the lock member R.

[0027]

Fig. 2 is a perspective view showing essential parts, which constitute the lock device, such as the slider 31 arranged in an interior of the bag portion 22 of the external door 20 shown in Fig. 1, etc., Fig. 3 is a perspective view schematically showing, in enlarged scale, the essential parts of the lock device shown in Fig. 2, and Fig. 4 is an exploded, perspective view showing the slider 31 shown in Fig. 2, as viewed from an opposite side to Figs. 2 and 3. Fig. 5 is a plan view showing, in enlarged scale, the slider 31 shown in Fig. 2, as viewed from above. As illustrated shown in Figs. 2 to 5, the lock device comprises a connecting member 32, a cylinder lever 33, and a restriction member 34 as well as the slider 31.

[0028]

The slider 31 is formed by appropriately bending a sheet metal such as steel sheet, or the like to be substantially C-shaped in cross section and formed with a rectangular-shaped opening (referred below to as slider opening) 3111, which is positioned on a base 311 to correspond to the opening 23 of the bag portion 22. Slots 3121 being longitudinal in a vertical direction are formed on upper portions of both sides 312 of the slider 31. The slider 31 is arranged slidably in

a vertical direction in a state of entering into a slider support piece (support member) 35 secured to the bag portion 22 of the external door 20 and being C-shaped in cross section. More specifically, through-holes 3511 are formed on both sides 351 of the slider support piece 35 and the slider 31 is arranged slidably in a vertical direction by inserting a slider pin member (not shown) through the through-holes 3511 and the slots 3121. Here, a position, in which the slider pin member abuts against lower edges of the slots 3121, defines an upper limit position of upward movement of the slider 31 and a position, in which the slider pin member abuts against upper edges of the slots 3121, defines a lower limit position of downward movement of the slider 31. The upper limit position defines a release position and the lower limit position defines a lock position. That is, the slider 31 is arranged movably between the lock position and the release position.

[0029]

A slider holding member 36 is journaled in an interior of the slider 31 to be able to swing about an axis of the slider pin member in a state of being inserted therethrough. The slider holding member 36 is formed by appropriately bending a sheet metal such as steel sheet, or the like to be substantially C-shaped in cross section and formed at a lower, extended end of a side 361, which is positioned toward an opened end of the external door 20, with a latch portion 3611, which

protrudes toward the base 311 (on a back side of the external door 20) of the slider 31, the slider holding member being biased toward the base 311 of the slider 31 at all times by a spring member B, which comprises a coiled spring wound around the slider pin member.

[0030]

With the slider holding member 36, when the slider 31 moves sliding upward to be positioned in the upper limit position, that is, the release position, the latch portion 3611 protrudes from the opening 3111 to engage with an upper edge of the opening 3111 to hold the slider 31 in a state of positioning the slider in the release position.

[0031]

On the other hand, in the case where the external door 20 is moved in a closing manner to close the front opening of the body cabinet 1, the slider holding member 36 enters the interior of the slider 31 through the slider opening 3111 after the lock member R arranged in the body cabinet 1 passes the opening 23 of the bag portion 22, and the lock member R entering the interior abuts against an abutting portion 3621 formed on a base 362 of the slider holding member 36 whereby the slider holding member swings in a manner to separate from the base 311 of the slider 31 against the bias of the spring member B. In this manner, when the slider holding member 36 swings in a manner to separate from the base 311 of the slider 31,

engagement between the latch portion 3611 and the upper edge of the slider opening 3111 is released, so that the slider 31 is moved slidably downward by its weight to reach the lower limit position, that is, the lock position. Thereby, the upper edge of the slider opening 3111 abuts against the lock member R, so that the slider 31 engages with the lock member R in the lock position.

[0032]

An abutting piece 3122 is formed integrally by means of welding in a predetermined location at an extended end of the side 312 positioned on an opposite side to the opened end of the external door 20, that is, in a location of the same level as that of the slider holding member 36. The abutting piece 3122 is provided in a manner to extend toward the opened end of the side 312 from the extended end thereof. Also, a notched portion 3622 is formed on the base 362 of the slider holding member 36 in a region on an opposite side to the opened end of the external door 20, that is, in a region opposed to the abutting piece 3122.

[0033]

The connecting member 32 is formed by appropriately bending a sheet metal such as steel sheet, or the like and provided integrally at a lower end of the slider 31 in a manner to protrude in an opposite direction to the opened end of the external door 20. As shown in Fig. 6, the connecting member

32 comprises a horizontal portion 321 extending horizontally and a hanging portion 322 extending downward from an end of the horizontal portion 321. A hook portion 323 is formed at an extended end of the hanging portion 322.

[0034]

The cylinder lever 33 is journaled in an inner cylinder of a key cylinder, which turns according to the locking operation and the unlocking operation of a key inserted into a key insertion port (not shown) provided on the front of the external door 20, to swing about an axis of a shaft portion thereof (an outer cylinder of the key cylinder is secured to a frame of the external door 20). More specifically, the cylinder lever moves unlockingly upward according to the unlocking operation of the key inserted into the key insertion port while moves lockingly downward according to the locking operation of the key. The cylinder lever 33 has an elliptical-shaped portion 331 and a rod member 332 is protrusively provided on a different portion of the elliptical-shaped portion 331 from the shaft portion and directed toward the hanging portion 322 of the connecting member 32. The rod member 332 is positioned in a region below the horizontal portion 321 of the connecting member 32.

[0035]

The restriction member 34 is formed by appropriately bending a sheet metal such as steel sheet, or the like and

arranged on the frame of the external door 20 with a restriction pin member 37 therebetween to be able to swing about an axis thereof being a central axis of the restriction pin member 37. The restriction member 34 is formed with a downwardly opened groove portion 341 and a weight portion 342 and positioned in a position of restriction by the weight portion 342 as shown in Fig. 3. In the case where the restriction member 34 is positioned in the position of restriction, the hook portion 323 of the connecting member 32 is permitted to enter the groove portion 341. That is, when positioned in the position of restriction, the restriction member 34 is positioned in a region above the hook portion 323.

[0036]

A guide member 38 is interposed between the restriction member 34 and the cylinder lever 33. The guide member 38 is connected to the restriction member 34 to abut against a part of a peripheral portion of the elliptical-shaped portion 331 of the cylinder lever 33 upon the unlocking movement of the cylinder lever 33 to cause the restriction member 34 positioned in the position of restriction to swing upward against the gravitational force of the weight portion 342 to move to a position of permission. Here, an adjustment is beforehand accomplished so that when the cylinder lever 33 moves unlockingly, the part of the peripheral portion of the elliptical-shaped portion 331 of the cylinder lever 33 abuts

against the guide member 38 before the rod member 332 of the cylinder lever 33 abuts against an underside of the horizontal portion 321 of the connecting member 32. Thereby, the restriction member 34 is positioned in the position of permission before the rod member 332 of the cylinder lever 33 abuts against the horizontal portion 321 of the connecting member 32, so that the hook portion 323 of the connecting member 32 separates from the groove portion 341 of the restriction member 34.

[0037]

With the vending machine, to which the lock device thus constructed is applied, the work such as replenishing the interior of the body cabinet 1 with commodities, etc. can be performed in the following manner.

[0038]

First, an explanation will be given to the case where the lock device holds a state, in which the external door 20 closes the front opening of the body cabinet 1. In such case, the slider 31, which constitute the lock device, is positioned in a lock position to engage with the lock member R and the restriction member 34 is positioned in the position of restriction.

[0039]

In such case, even when a third indiscrete person turns up a burglerproof plate 24 (see Fig. 5) of the external door

20 to insert a foreign matter into the slider opening 3111 of the slider 31 positioned in a lock position to try to slidingly move the slider 31 upward, the hook portion 323 of the connecting member 32 formed integral with the slider 31 abuts against the restriction member 34 positioned in the position of restriction to inhibit slidingly moving the slider 31 further upward as shown in Fig. 8.

[0040]

A routeman who performs the work such as replenishing the vending machine with commodities, etc. inserts a key into a key insertion port to operatively unlock the key whereby the cylinder lever 33 is unlockingly moved upward as shown in Fig. 7. A part of the peripheral portion of the cylinder lever 33 thus unlocked abuts against the guide member 38 whereby the restriction member 34 swings to the position of permission from the position of restriction against the gravitational force of the weight portion 342. Thereby, the hook portion 323 of the connecting member 32 separates from the groove portion 341 of the restriction member 34. That is, when positioned in the position of restriction, the restriction member 34 restricts an upward displacement magnitude of the connecting member 32 to inhibit the slider 31 from slidingly moving to the release position from the lock position while permitting displacement of the connecting member 32 when positioned in the position of permission.

[0041]

Thereafter, as shown in Figs. 9 and 10, the rod member 332 of the cylinder lever 33, which moves unlockingly, abuts against the underside of the horizontal portion 321 of the connecting member 32 and the connecting member 32 is pushed by the rod member 332 to be displaced upward with the result that the slider 31 formed integral with the connecting member 32 also slidingly moves toward the release position from the lock position.

[0042]

In this manner, when the slider 31 slidingly moves upward to be positioned in the release position, the latch portion 3611 of the slider holding member 36 protrudes on a back surface side from the opening 3111 to engage with the upper edge of the opening 3111 to hold the slider 31 positioning the slider in the release position. In this manner, when the slider 31 is held in the release position, a state of engaging with the lock member R is released.

[0043]

Here, the connecting member 32 comprises the horizontal portion 321 and the hanging portion 322 and is configured to be opened downward. Therefore, even when a routeman operatively locks the key in order to pull out the key from the key insertion port, the cylinder lever 33 is permitted to lockingly move downward in a state, in which the slider 31 is

positioned in the release position, as shown in Figs. 11 and 12.

[0044]

That is, in the case where the connecting member 32 is arranged integrally with the slider 31 and the cylinder lever 33 unlockingly moves, the connecting member is caused to abut against the cylinder lever 33 to be thereby displaced to move the slider 31 to the release position from the lock position while permitting the locking movement at all times in the case where the cylinder lever 33 lockingly moves.

[0045]

In this manner, since the connecting member 32 permits the cylinder lever 33 to lockingly move at all times, a routeman openingly moves the external door 20 after pulling out the key from the key insertion port, thereby enabling opening the front opening of the body cabinet 1 and thereafter openingly moving the internal door 10 to perform the work such as replenishment of commodities, etc.

[0046]

In this case, even after the cylinder lever 33 moves lockingly, a tip end of the hook portion 323 of the connecting member 32 formed integral with the slider 31 positioned in the release position abuts against the restriction member 34 to position the same in the position of permission.

[0047]

After performing the work such as replenishment of commodities, etc., a routeman moves the external door 20 closingly to close the front opening of the body cabinet 1 whereby the lock member R of the body cabinet 1 enters the interior of the slider 31 through the slider opening 3111 to abut against the abutting portion 3621 formed on the base 362 of the slider holding member 36. Thereby the slider holding member 36 swings in a manner to separate from the base 311 of the slider 31 to release engagement between the latch portion 3611 and the upper edge of the opening 3111, so that the slider 31 is moved slidingly downward by its weight to reach the lower limit position, that is, the lock position to enable holding a state, in which the upper edge of the opening 3111 and the lock member R abut against each other, the slider 31 engages with the lock member R in the lock position, and the external door 20 closes the front opening of the body cabinet 1. That is, in case of performing the work such as replenishment of commodities, etc. and then closingly moving the external door 20 to close the front opening of the body cabinet 1, it is unnecessary to again insert the key into the key insertion port as in the related art to perform an unlocking operation, etc.

[0048]

By the way, with the lock device described above, the abutting piece 3122 is formed integrally at the extended end of the side 312 (the side 312 positioned on an opposite side

to the opened end of the external door 20) of the slider 31 and the notched portion 3622 is formed in a region opposed to the abutting piece 3122 on the base 362 of the slider holding member 36.

[0049]

Thereby, even when, for example, a third indiscrete person turns up the burglerproof plate 24 provided on the external door 20 to cause a tool K, such as screwdriver, etc, being a lengthy rod body to enter from the opening 3111 in the case where a state, in which the external door 20 closes the front opening of the body cabinet 1, is held, it is possible to cause the tip end of the tool K to abut against the abutting piece 3122 as shown in Fig. 13. Therefore, both the tip end and an intermediate portion of the tool K abut against the slider 31 being the same member, so that even when the tool K is caused to swing in a vertical direction with the tip end as a fulcrum, the slider 31 is only deformed due to the principle of a lever and there is no fear that the slider 31 separates from the slider holding member 36 or the like to slidingly move toward the release position from the lock position.

[0050]

As described above, with the lock device of a vending machine, according to the embodiment, in the case where the cylinder lever 33 unlockingly moves, the connecting member 32 is caused to abut against the cylinder lever 33 to be thereby

displaced to move the slider 31 to the release position from the lock position while permitting the locking movement at all times in the case where the cylinder lever 33 lockingly moves, it is unnecessary to again insert the key into the key insertion port in case of performing the work such as replenishment of commodities, etc. and then closingly moving the external door 20, and so the work such as replenishment of commodities, etc. is not made complex. Also, when positioned in the position of restriction, the restriction member 34 restricts the upward displacement magnitude of the connecting member 32 to inhibit the slider 31 from slidingly moving to the release position from the lock position while permitting displacement of the connecting member 32 when positioned in the position of permission, so that the burglerproof quality is ensured in the case where a state, in which the external door 20 closes the front opening of the body cabinet 1, is held. Accordingly, it is possible to favorably ensure the burglerproof quality while making the work such as replenishment of commodities, etc. high in efficiency.

[0051]

Also, with the lock device, even in the case where, for example, a tool K or the like is caused to enter from the opening 3111, the tip end of the tool K or the like abuts against the abutting piece 3122 formed integral with the slider 31, so that there is no fear that the slider 31 separates from the slider

holding member 36 or the like to slidingly move to the release position from the lock position, whereby it is possible to prevent the slider 31 from moving toward the release position from the lock position.

[0052]

As described above, the lock device of a vending machine, according to the invention, is useful in holding a state, in which a door body closes the front opening of a body of the vending machine.

WHAT IS CLAIMED IS:

1. A lock device of a vending machine, comprising:
a body of the vending machine, which is rectangular-shaped with a front thereof opened and in which commodities are received;

a lock member mounted to one of the body of the vending machine and a door body arranged to enable opening and closing the front opening;

a slider arranged on the other of the body of the vending machine and the door body to be movable between a lock position of being able to engage with the lock member and a release position, in which engagement with the lock member is released, the lock member and the slider engaging with each other to hold a state, in which the door body closes the front opening of the body of the vending machine, and engagement of the lock member and the slider being released to permit the door body to openingly move to open the front opening of the body of the vending machine;

a cylinder lever moving lockingly and moving unlockingly about an axis thereof according to the locking operation and the unlocking operation of a key into a predetermined key insertion port;

a connecting member arranged integrally with the slider and caused, in the case where the cylinder lever unlockingly moves, to abut against the cylinder lever to be displaced to

move the slider to an unlock position from the lock position while, in the case where the cylinder lever lockingly moves, permitting the locking movement at all times; and

a restriction member that normally restricts a displacement magnitude of the connecting member to inhibit the slider from moving to the release position from the lock position while permitting displacement of the connecting member in the case where the cylinder lever unlockingly moves.

2. The lock device of a vending machine, according to claim 1, wherein the restriction member is arranged to be able to swing about an axis thereof between a position of restriction and a position of permission and restricts a displacement magnitude of the connecting member, when positioned in the position of restriction, to inhibit the slider from moving to the release position from the lock position while permitting displacement of the connecting member when positioned in the position of permission, the lock device comprising a guide member interposed between the cylinder lever and the restriction member to abut against the cylinder lever to swing the restriction member to the position of permission from the position of restriction in the case where the cylinder lever unlockingly moves.

3. The lock device of a vending machine, according to claim 1, further comprising:

a slider holding member that holds the slider in the

release position in the case where the slider moves to the release position from the lock position, and releases holding of the slider to permit the slider to move to the lock position from the release position in the case where the lock member enters the slider positioned in the release position.

4. The lock device of a vending machine, according to claim 2, further comprising:

a slider holding member that holds the slider in the release position in the case where the slider moves to the release position from the lock position, and releases holding of the slider to permit the slider to move to the lock position from the release position in the case where the lock member enters the slider positioned in the release position.