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(54) **Coin storage structure.**

(57) A coin storage structure includes a partition plate, a coin storage window, a shielding plate, and a link mechanism. The partition plate vertically partitions a housing into a processing chamber for storing a coin processing unit and a safe chamber for storing a safe. The coin storage window is formed in the partition plate to cause a coin discharged from the coin processing unit to drop into the safe in the safe chamber, thereby storing the coin. The shielding plate selectively opens and closes the coin storage window. The link mechanism removes the shielding plate from the coin storage window in a state that at least the door of the processing chamber is kept closed, and causes the shielding plate to face the coin storage window to shield the coin storage window in synchronism with an opening operation of the door.

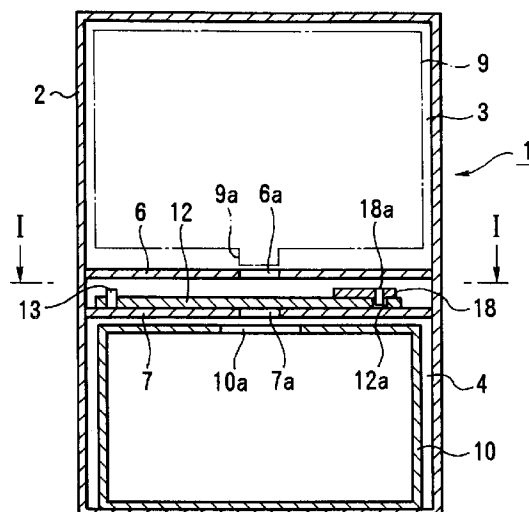


FIG. 1

Background of the Invention

The present invention relates to a coin storage structure in a vending machine or pay phone.

A coin storage structure of this type generally has a partition plate 20 for dividing a housing 2 of a vending machine 1 into an upper chamber 3 and a lower chamber 4, as shown in Fig. 4. A coin handling unit 9 including a coin slot, a coin discrimination mechanism, a coin storage mechanism, and a coin storage path (none are shown) is disposed in the upper chamber 3. The lower chamber 4 stores as a safe 10 serving as a safe chamber. Windows 20a and 10a are respectively formed in the partition plate 20 and the safe 10 at positions corresponding to an outlet end 9a of the coin handling unit 9. Coins discharged from the outlet end 9a of the coin handling unit 9 drop from the windows 20a and 10a and are stored in the safe 10.

In a state wherein the safe 10 is stored in the safe chamber 4, the window 10a is open. When the front door is open for maintenance or the like, pincers or a rod having a distal end with an adhesive can be inserted from the coin handling unit 9 into the window 10a through the window 20a, coins can be illegally removed, resulting in inconvenience. In order to prevent this, a guide path 20b from the coin handling unit 9 to the safe 10 is formed and is curved or inclined to prevent the window 10a of the safe 10 from being exposed outside, thus making it difficult to insert the pincers or the rod into the safe 10.

In the conventional coin storage structure described above, to close the window 20a by the inclined or curved guide path 20b, the overall height of the structure is undesirably increased, and the resultant apparatus becomes vertically bulky.

Summary of the Invention

The present invention has been made in consideration of the conventional drawbacks described above, and has as its object to provide a compact coin storage structure capable of properly preventing coins from being illegally removed from a safe.

In order to achieve the above object of the present invention, there is provided a coin storage structure comprising a partition plate for vertically partitioning a housing into a processing chamber for storing a coin processing unit and a safe chamber for storing a safe, a coin storage window, formed in the partition plate, for causing a coin discharged from the coin processing unit to drop into the safe in the safe chamber, thereby storing the coin, a shielding plate for selectively opening and closing the coin storage window, and a link mechanism for removing the shielding plate from the coin storage window in a state that at least the door of the processing chamber is kept closed, and for causing the shielding plate to face the coin storage window to shield the coin stor-

age window in synchronism with an opening operation of the door.

According to the present invention, when the door of the handling chamber for storing the coin handling unit is open, the coin storage window formed in the partition plate disposed between the handling chamber and the safe chamber is automatically shielded by a shielding plate.

Brief Description of the Drawings

Fig. 1 is a longitudinal sectional front view showing a vending machine employing a coin storage structure according to an embodiment of the present invention;

Fig. 2 is a cross-sectional view along the line I - I in Fig. 1;

Fig. 3 is a cross-sectional view along the line I - I when a door in Fig. 1 is kept open;

Fig. 4A is a longitudinal sectional front view showing a conventional coin storage structure; and

Fig. 4B is a longitudinal sectional side view showing the conventional coin storage structure.

Description of the Preferred Embodiment

An embodiment of the present invention will be described with reference to the accompanying drawings. Fig. 1 shows a vending machine employing a coin storage structure according to the present invention, Fig. 2 shows the vending machine taken along the line I - I in Fig. 1, and Fig. 3 shows the vending machine taken along the line I - I in Fig. 1 when a door is kept open. The same reference numerals as in Figs. 4A and 4B denote the same parts in Figs. 1 to 3, and a detailed description thereof will be omitted.

Referring to Fig. 1, a housing 2 of a vending machine 1 is partitioned into a handling chamber 3 serving as an upper chamber and a safe chamber 4 serving as a lower chamber by a pair of partition plates 6 and 7 spaced apart from each other by a predetermined distance. Windows 6a and 7a are respectively formed in the partition plates 6 and 7 at positions corresponding to an outlet end 9a of a coin storage path of a coin handling unit 9. The windows 6a and 7a are aligned on the same vertical line.

A shielding plate 12, one end of which is pivotally supported by a pin 13 serving as a fulcrum extending on the deeper corner of the partition plate 7, is disposed between the partition plates 6 and 7 in the longitudinal direction of the partition plates. The other end of the shielding plate 12 has an inverted V-shaped guide groove 12a. As shown in Fig. 2, the shielding plate 12 is kept removed from the window 7a of the partition plate 7 while a door 15 is kept closed. However, as shown in Fig. 3, when the door 15 is kept open, the shielding plate 12 is brought into contact with the partition plate so as to shield the window 7a.

The door 15 is supported to be pivotal about a shaft 16 fixed in the housing 2, so that the front opening of the housing 2 can be opened. An intermediate plate 17 is integrally formed like a shelf inside the door 15. A sliding plate 18 having a pin 18a at its distal end is mounted near the shaft 16 of the intermediate plate 17. The pin 18a is engaged with the guide groove 12a of the shielding plate 12 and is slidably moved in the guide groove 12a during pivotal movement of the door 15. The sliding plate 18, the pin 18a, and the guide groove 12a constitute a link mechanism for the door 15 and the shielding plate 12.

With the above construction, in the state shown in Fig. 2, when the door 15 is opened for maintenance or the like and the door 15 is pivoted about the shaft 16 counterclockwise in Fig. 3, the pin 18a causes pivotal movement of the shielding plate 12 and is slid along the guide groove 12a. That is, the pin 18a is slid along the guide groove 12a to pivot the shielding plate 12 about the pin 13 clockwise, thereby shielding the window 7a of the partition plate 7 by the shielding plate 12. When the door 15 is open, it is impossible to illegally insert pincers or the like in the window 6a of the partition plate 6 from the coin handling unit 9 to remove coins from the safe 10.

At this time, since the pin 18a temporarily comes close to the pin 13 and is then away therefrom so as to draw an arc, the pin 18a abruptly causes pivotal movement of the shielding plate 12 and is located to the left end of the inverted V-shaped guide groove 12a formed in the shielding plate while the door 15 is being opened. Thereafter, the pin 18a is slid such that it becomes located at the central portion of the guide groove 12a. In the initial period of opening the door 15, the shielding plate 12 is immediately pivoted. While the door 15 is then being opened, the pivot amount of the shielding plate 12 is reduced. When the door 15 is open, the window 7a can be properly shielded by the shielding plate 12, thereby preventing illegal coin removal. In addition, since the moving amount of the shielding plate 12 is reduced after the shielding plate 12 shields the window 7a, the shielding plate 12 will not protrude from the housing 2 in a full-open state of the door 15.

In this embodiment, the shielding plate 12 is pivoted interlockingly with an opening/closing operation of the door 15 through the sliding plate 18 by mounting the sliding plate 18 on the intermediate plate 17. However, the present invention is not limited to this construction. For example, part of the intermediate plate 17 may be extended, and the pin 18a may directly extend on this extended portion. In addition, the pair of partition plates 6 and 7 are formed. However, only the partition plate 7 for pivotally supporting the shielding plate 12 may be used.

As has been described above, according to the present invention, the shielding plate is formed in the coin storage window of the partition plate for partition-

ing the housing into the coin handling chamber and the safe chamber, and the shielding plate is opened/closed interlockingly with at least the opening/closing operation of the door of the coin handling chamber, thereby properly preventing illegal coin removal from the safe in the open door. In addition, the height is reduced as compared with the conventional guide path, thereby obtaining a compact apparatus.

Claims

1. A coin storage structure, characterized by comprising:
 - a partition plate (6, 7) for vertically partitioning a housing into a processing chamber (3) for storing a coin processing unit (9) and a safe chamber (4) for storing a safe (10);
 - a coin storage window (6a, 7a), formed in said partition plate, for causing a coin discharged from said coin processing unit (9) to drop into said safe (10) in said safe chamber (4), thereby storing the coin;
 - a shielding plate (12) for selectively opening and closing the coin storage window (6a, 7a); and
 - a link mechanism (12a, 18a) for removing said shielding plate (12) from the coin storage window (6a, 7a) in a state that at least said door (15) of said processing chamber (3) is kept closed, and for causing said shielding plate (12) to face the coin storage window (6a, 7a) to shield the coin storage window (6a, 7a) in synchronism with an opening operation of said door (15).
2. A structure according to claim 1, wherein said link mechanism (12a, 18a) greatly moves said shielding plate (12) in an initial period of opening said door (15) to shield the coin storage window (6a, 7a) and almost stops movement of said shielding plate (12) in a subsequent closing operation.
3. A structure according to claim 1, wherein said link mechanism (12a, 18a) comprises a pin (18a) arcuately pivoted upon an opening operation of said door (15) and an inverted V-shaped guide groove (12a) formed at a free end portion of said shielding plate (12) and engaged with said pin (18a), so that said pin (18a) is pivoted to slide along the guide groove (12a) to move said shielding plate (12).
4. A structure according to claim 1, wherein said shielding plate (12) is pivotally supported by a support shaft (13) extending on said partition plate (6, 7).
5. A structure according to claim 1, wherein said

partition plate (6, 7) comprises a pair of partition plates, and said shielding plate (12) is disposed between said pair of partition plates.

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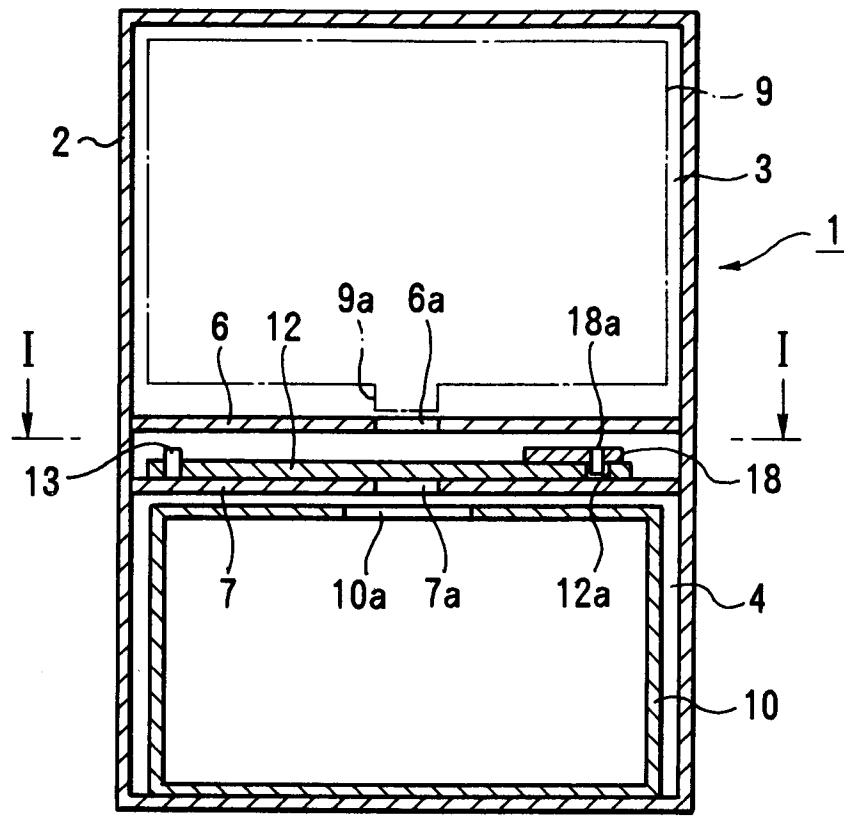


FIG. 1

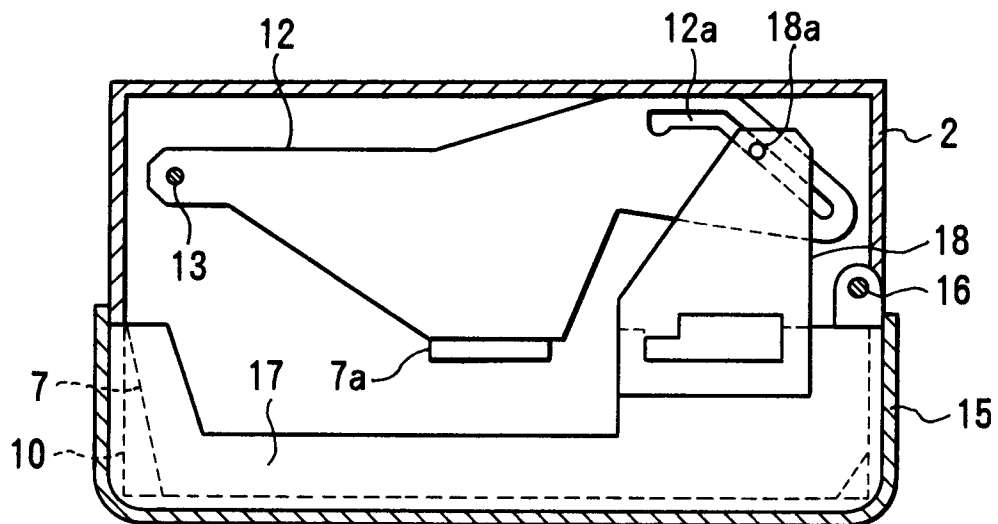


FIG. 2

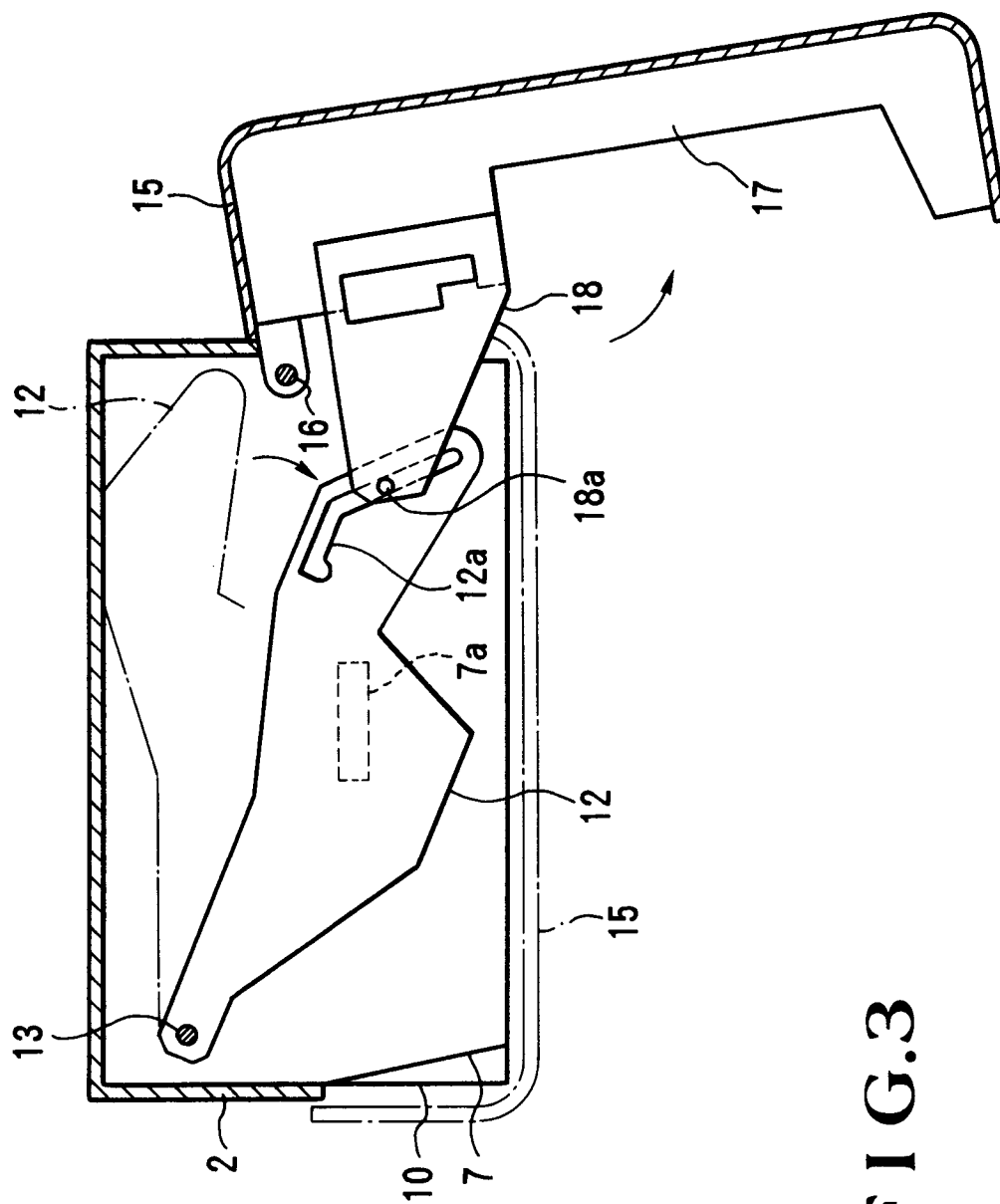


FIG. 3

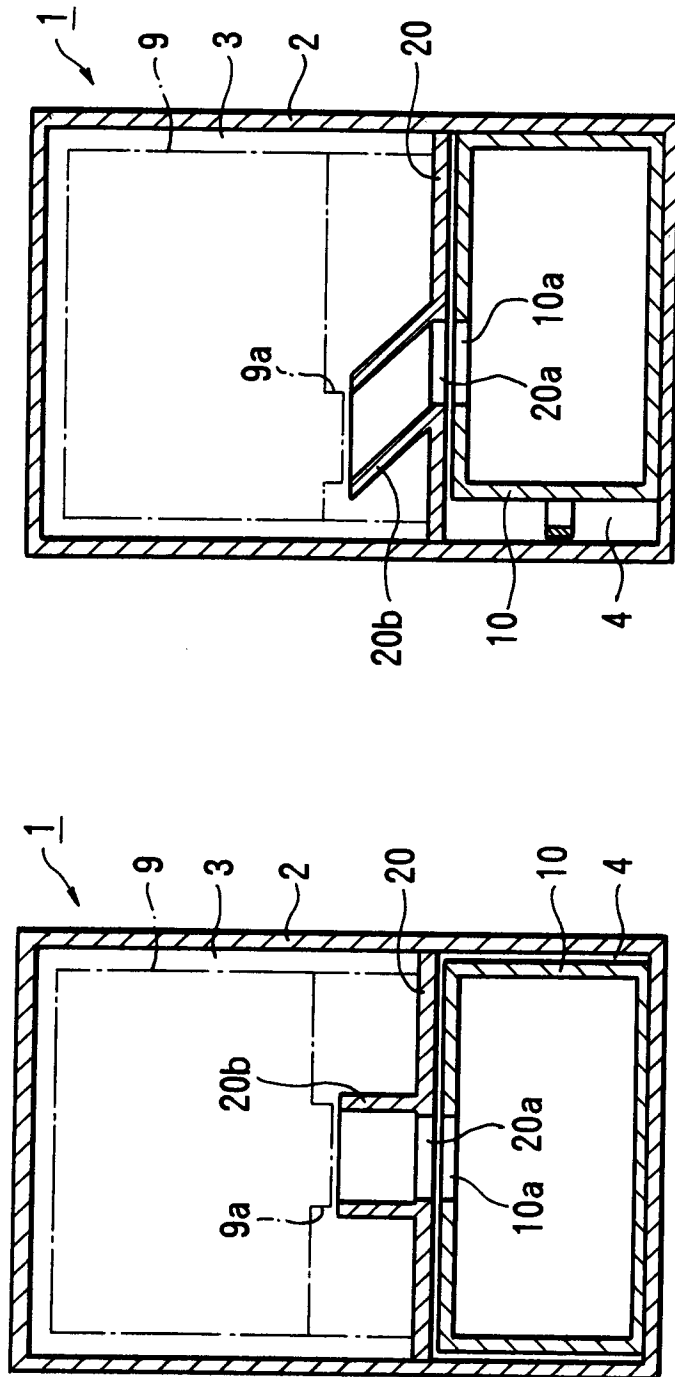


FIG. 4B
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FIG. 4A
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