

A COIN LOADING SYSTEM

The present invention relates generally to reloading coins into any machine having a coin storage chamber, e.g. a change-dispensing machine.

A stock of coins must periodically be loaded into the coin storage chamber of such a machine. The invention is concerned with preventing access to the inside of the coin storage chamber and to the inside of a coin cartridge in which the coins are transported to the machine. The invention is also concerned with allowing said coin cartridge to be used to re-load the coin storage chamber of the machine, after being taken from a place where the cartridge is filled with coins, transfer to the machine's coin chamber still not providing access to the coins.

The present invention provides a coin loading system comprising a machine having at least one coin storage chamber, and a coin transport cartridge capable of being received in said coin storage chamber, wherein the coin cartridge comprises first and second hollow, co-axial, cylindrical casings having their ends closed by respective end plates, and with the second casing being rotatably received inside the first casing, said casings having corresponding first and second openings in their cylindrical walls capable of being brought into co-incidence by relative rotation of the casings to provide access to the inside of the second (inner) casing, the outer casing having a lock body made fast to one of its end plates and the inner casing having a cylindrical drum of said lock made fast to the corresponding end plate of the inner casing whereby relative rotation of the casings to provide access to the inside of the inner casing is prevented unless a suitable key is inserted into the lock, and wherein the coin storage chamber includes a cartridge receiving magazine comprising a first hollow cylindrical wall which is stationary and which coaxially receives a second hollow cylindrical wall capable of rotating therein, the first wall, is open at one end is closed at its other end by an end plate and is integral with the coin storage chamber, having an opening through its cylindrical surface giving access thereto, the second wall has a corresponding opening through its cylindrical wall which is capable of being rotated into coincidence with the opening through the first wall, the second wall further has an end plate adjacent to the end

plate of the first wall and a cartridge-receiving door at its other end, and the first and second walls are so arranged that :

(1) said door is capable of opening only when the openings through the first and second walls are not even in partial coincidence, and said second wall is not capable of rotating to a position even of partial co-incidence while the door is open ;

(2) the end plate of the first wall has a stationary key projecting along the axis of the magazine through the end plate of the second wall to engage the lock of a cartridge inserted into the magazine ; and

(3) the end plate of the second (inner) wall has a drive lug for engaging a corresponding cavity in the end plate of the outer casing of an inserted coin cartridge, the position of the lug and the cavity being such that, when a cartridge is inserted in the second wall with the door closed behind the cartridge and the key operating the lock, rotation of the door causes the second (inner) wall to rotate the first (outer) casing by means of the drive lug while the outer wall holds the inner casing stationary, the rotating members are then rotated until all four openings are brought into coincidence thereby putting the coin cartridge into communication with the coin storage chamber.

According to a preferred embodiment of the invention, the end plate of the stationary cylindrical wall which is integral with the coin storage chamber, has a finger passing through 180° arcuate openings in the end plates of the inner wall and the outer casing to engage the inner casing, thereby reducing the twist to which the key is subjected during operation.

The invention will be better understood from the description of an embodiment of the invention given hereinafter with reference to the accompanying drawings in which :

Figure 1 is a longitudinal section through a portion of a machine in accordance with the invention showing a magazine for receiving a coin cartridge which is to be loaded into a coin storage chamber.

Figure 2 is a cross-section along a line II-II of Figure 1.

Figure 3 is analogous to Figure 1 but show a coin cartridge in the closed position inserted in the magazine.

Figure 4 is a cross-section along line IV-IV of Figure 3.

Figure 5 is analogous to Figure 3 but the assembly is in the open position to allow coins to be transferred from the coin cartridge to the coin storage chamber.

Figure 6 is a cross-section along line VI-VI of Figure 5.

Figure 7 shows in detail how the cash box magazine closes.

Figure 8 is a cross-section along a line VIII-VIII of Figure 7.

Figure 9 is analogous to Figure 8 but with the door open.

Figure 10 is an exploded view.

Figures 1 and 2 show a portion of a coin storage chamber 1 for any type of coin machine, e.g. a machine for giving change.

The top of said coin storage chamber has a magazine 2 designed to receive a cartridge full of coins to be loaded into the storage chamber 1.

The magazine 2 is constituted by two hollow coaxial cylindrical walls - a stationary outer wall 3, integral with the wall 4 of the coin storage chamber 1 and a rotatable second wall 7 inside the first wall and rotatable about their common axis. The outer wall 3 has an opening 5 which communicates with the coin storage chamber 1 and end plate 6 which closes one of the ends of the magazine.

Said rotatable second wall 7 has an end plate 8 adjacent to the end plate 6 of the first wall 3 and its other end has a swing door 9 with an operating handle 10. Said rotatable second (inner) wall 7 also has an opening 11 whose dimensions are the same as those of the opening 5 of the stationary first (outer) wall 3.

The two openings 5 and 11 can be made to coincide by rotating the rotatable second (inner) wall 7 using the handle 10 on its door 9.

Figures 7, 8 and 9 show in detail two members which serve both to allow the door 9 to open only when the opening 11 of the second wall 7 is diametrically opposite to the opening 5 of the first wall 3 and to prevent the second wall 7 from rotating when the

door 9 is open. To accomplish the first of the above purposes, the first stationary wall 3 has a latch 12 and the door 9 has a notch 13 and to accomplish the second of the above purposes, the door 9 has a heel pin 15 below the door hinge 14. When the door opens, said heel pin fits into a notch 16 in the stationary wall 3 thus preventing the rotation of the second wall 7. Figures 7 and 8 show the door in a position in which it is closed but is ready to be opened and in which the second wall 7 is ready to be turned. Both of these operations are performed using the handle 10, although only one of them - turning or opening - can be performed at a time. Figure 9 shows door in the open position in which rotation of the wall 7 is prevented. In said position, the opening 11 of the second wall is then necessarily in the position illustrated in Figures 1 and 2.

Now, with reference to Figures 3 and 4, it can be seen that a coin cartridge 50 placed inside the magazine 2 is constituted by two casings - an outer casing 17 and an inner casing 18. These two casings are cylindrical, hollow and coaxial. The outer casing 17 has an opening 19 and the inner casing 18 has an opening 20. These openings have the same dimensions as each other and are a little narrower than the openings 5 and 11 of the walls 3 and 7 of the magazine as illustrated in Figure 4. The outside casing 17 has an end plate 21 at its end adjacent to the end plates 6 and 8. A lock body 22 is fixed on the axis of said casing 17. The lock has cylindrical drum 23 made fast with an end plate 24 of the inner casing 18 of the coin cartridge via an extension 23 A projecting from the drum 23. End plates 25 and 26 close the other ends of the outer casing 17 and of the inner casing 18 respectively. The end plate 25 has a shaft 25A built into it. The outer casing 17 is movable relative to the inner casing 18 but rotation thereof is made possible only by inserting a key 27 into the lock. Such a key 27 is fixed on the axis of the end plate 6 of the outer wall 3 of the magazine.

To enable rotation of the inner wall 7 by means of the handle 10 also to drive the outer casing 17 of the coin cartridge the end plate 8 of the inner wall 7 carries a drive lug 28 which co-operates with a complementary cavity 29 in the end plate 21 of

the outer casing 17 of the coin cartridge. During the above rotation, the inner casing 18 of the coin cartridge remains stationary since it is connected to the drum 23 of the lock, said drum remaining stationary since it receives the stationary key 27. However, as a safety measure, the end plate 6 is fitted with a finger 30 which passes freely through the end plate 8 of the moving inner wall 7 and the plate 21 of the outer casing 17 of the cash box via 180° arcuate openings through these end plates. Figure 2 shows one of these openings 31 in the end plate 8. Said finger 30 enters a retaining cavity 32 located on the end plate 24 of the inner casing 18 of the coin cartridge. The lug 28 associated with the cavity 29 and the finger 30 associated with the retaining cavity 32 are located in such a way that when the coin cartridge 50 is placed in its magazine 2, in such a manner than the key 27 enters the lock, the opening 20 of the inner casing is caused to coincide with the opening 5 of the outer wall 3 while the opening 19 of the outer casing 17 is diametrically opposite thereto, as is shown in Figure 3 and 4, i.e. the coin cartridge is inserted in its magazine but communication between the storage chamber 1 and the inside of the coin cartridge is closed.

When the door is closed, the handle 10 can be turned through 180° and, thereby rotating the outer casing 17 and the inner wall 7 simultaneously, causing all the openings 5, 11, 19 and 20 to coincide. This allows the contents of the coin cartridge to fall into the storage chamber 1. Figures 5 and 6 show the latter position in which, due to the latch 12 (Figures 7 and 8), it is impossible to open the door 9.

The process is therefore as follows :

The coin cartridge is loaded with coins at a special centre which has a key identical to the key 27. When the cash box is full, it is locked and given to a messenger who does not have the key. At the machine site, the door 9 is opened (by turning it if necessary if it is not already in a position which allows opening), the coin cartridge is inserted and pushed fully home, the door is closed and the handle 10 is turned through 180°. If the storage chamber 1 has to be filled with the contents of a plurality of coin cartridges, the first cartridge is

removed, another one is inserted, etc... The last cartridge may optionally be left inserted, in the magazine, thereby increasing the contents of the storage chamber by the value of the contents of one coin cartridge.

- 5 If the machine is a change dispensing machine, it may have a plurality of independent storage chambers, each storage chamber containing coins of a given category ; then each storage chamber can be fitted with suitable keying devices having a complementary device on the reloading coin cartridges to prevent coins of the
10 wrong category being loaded into a given storage chamber.

Figure 10 is an exploded view of the various parts. Naturally in the assembled machine, the inner wall 7 of the cash box magazine is prevented from moving longitudinally, using means which are not shown but which prevent removal of said wall by defrauders.

- 15 The coin cartridge 50 has a handle 60 to facilitate its insertion in or removal from the magazine.



CLAIMS

1/ A coin loading system comprising a machine having at least one coin storage chamber, and a coin transport cartridge capable of being received in said coin storage chamber, wherein the coin cartridge comprises first and second hollow, co-axial, cylindrical casings having their ends closed by respective end plates, and with the second casing being rotatably received inside the first casing, said casings having corresponding first and second openings in their cylindrical walls capable of being brought into co-incidence by relative rotation of the casings to provide access to the inside of the second (inner) casing, the outer casing having a lock body made fast to one of its end plates and the inner casing having cylindrical drum of said lock made fast to the corresponding end plate of the inner casing whereby relative rotation of the casings to provide access to the inside of the inner casing is prevented unless a suitable key is inserted into the lock and wherein the coin storage chamber includes a cartridge receiving magazine, comprising a first hollow cylindrical wall which is stationary and which coaxially receives a second hollow cylindrical wall capable of rotating therein, the first wall is open at one end, is closed at its other end by an end plate and is integral with the coin storage chamber, having an opening through its cylindrical surface giving access thereto, the second wall has a corresponding opening through its cylindrical wall which is capable of being rotated into coincidence with the opening through the first wall, the second wall further has an end plate adjacent to the end plate of the first wall and a cartridge-receiving door at its other end, and the first and second walls are so arranged that :

(1) said door is capable of opening only when the openings through the first and second walls are not even in partial coincidence, and said second wall is not capable of rotating to a position even of partial co-incidence while the door is open ;

(2) the end plate of the first wall has a stationary key projecting along the axis of the magazine through the end plate of the second wall to engage the lock of a cartridge inserted into



the magazine ; and

(3) the end plate of the second (inner) wall has a drive lug for engaging a corresponding cavity in the end plate of the outer casing of an inserted coin cartridge, the position of the lug and the cavity being such that, when a cartridge is inserted in the second wall with the door closed behind the cartridge and the key operating the lock, rotation of the door causes the second (inner) wall to rotate the first (outer) casing by means of the drive lug while the outer wall holds the inner casing stationary, the rotating members are then rotated until all four openings are brought into coincidence thereby putting the coin cartridge into communication with the coin storage chamber.

2/ A system according to claim 1, wherein the end plate of the stationary cylindrical wall which is integral with the coin storage chamber, has a finger passing through 180° arcuate openings in the end plates of the inner wall and the outer casing to engage the inner casing, thereby reducing the twist to which the key is subjected during operation.

3/ A coin loading system substantially as herein described with reference to and as illustrated in the accompanying drawings.
