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ESCROW CUP FOR COIN OPERATED VENDING MACHINES AND THE LIKE

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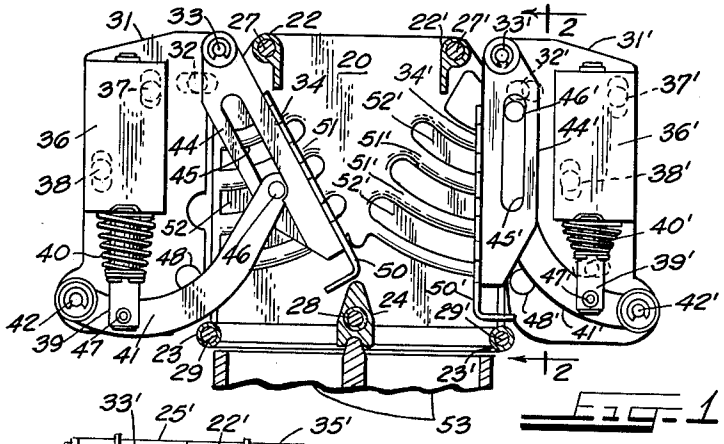


FIG. 1

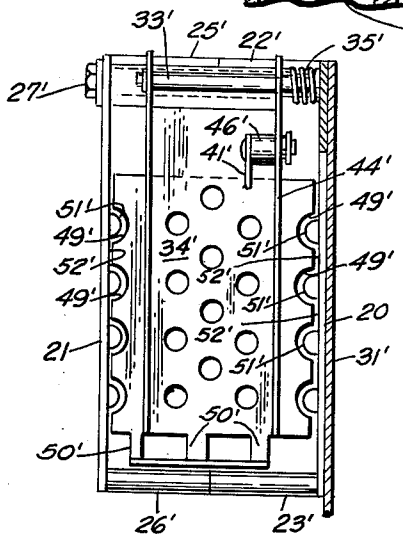


FIG. 2

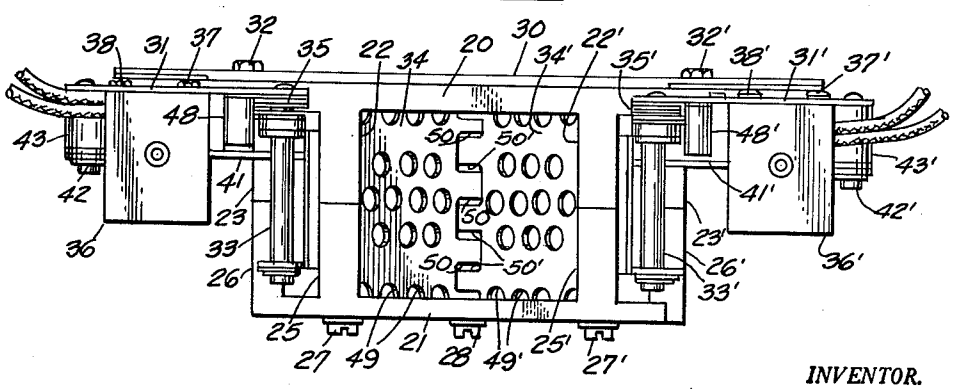


FIG. 3

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ESCROW CUP FOR COIN OPERATED VENDING MACHINES AND THE LIKE

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This invention relates generally to an escrow cup for receiving coins deposited in an associated coin-operated vending machine tor the like, said cup being of the type adapted upon actuation to release said coins to a cash box if merchandise has been delivered to the customer and to release said coins to a coin return if merchandise has not be so delivered.

In a coin-operated vending machine it is desirable to provide means for temporarily holding coins deposited therein rather than directing such coins immediately to a cash box from which they cannot be returned. Such temporarly coin-holding means are generally referred to as escrow cups and they are designed to release coins deposited therein to either of two associated coin-receiving means depending upon whether such coins are to be retained in the machine or returned to the customer.

In other words, an escrow cup may be made responsive to the delivery of merchandise so as to release such coins to a cash box and it may also be rendered responsive to actuation of a coin return button, if merchandise has not been delivered, so as to release said coins to a coin return chute or the like.

Previous attempts have been made to design a satisfactory escrow cup but such attempts have not been entirely successful. It is, of course, necessary to provide a movable door or floor member which upon actuation will be displaced so as to create an opening through which the coins therein may fall or be ejected. In many prior devices of this type the member upon which the coins rest is arranged to move in such a manner that upon actuation the coins are initially moved in a direction other than the opening. It will be understood that if an escrow cup is designed to release coins therefrom by permitting them to fall downwardly due to gravity, and most such devices are so designed, initial movement of said coins in any other direction will extend the time required to release them from the cup.

Generally, the movable floor member or door is opened for only a brief period of time and such delay may thus cause the coins to be improperly retained within the cup. For example, in one of the escrow cups heretofore known the coins rest on a pivotally mounted floor member which is adapted upon actuation to move to one side or the other to provide an outlet opening. Such lateral movement of the floor member will tend to jostle the coins about within the cup and in such a device the door may often return to its closed position before the coins have been released.

Another problem encountered with prior devices of this type is jamming of the mechanism due to a coin becoming lodged within the cup in a crevice or the like. Even if any necessary clearances or crevices in such a device are originally designed to be small enough to prevent this problem, yet any slight deformation of the parts or inaccuracy in manufacturing will, in many of the escrow cups heretofore known, cause an opening or crevice in which a small coin can become lodged so as to interfere with the operation of the mechanism.

One object of this invention is, therefore, to provide an escrow cup which is reliable in its operation and which will upon actuation permit coins deposited therein to be released quickly without jostling them about or imparting any undesirable motion thereto.

A further object of the invention is to piovide an escrow

cup which is not susceptible to jamming due to the lodging of a coin within the cup in a crevice or the like.

Another of my objects is to provide such a cup having a pair of pivotally mounted gates or doors which are adapted to be positively locked when in their closed positions so as to prevent release of coins deposited therein except upon actuation of gate-opening means associated therewith.

These and other objects and advantages of the invention will be apparent from the following description of a preferred embodiment thereof, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a front elevational view, partly in section, of an escrow cup embodying my invention, a front wall being removed for purposes of illustration;

FIG. 2 is a rear elevational view of a pivotally mounted gate taken along the line 2—2 of FIG. 1; and

FIG. 3 is a top plan view of said escrow cup.

Referring now to the drawings, it will be seen that in the embodiment illustrated my escrow cup comprises left and right-hand portions which are symmetrical. For this reason, corresponding elements in the two symmetrical portions will be identified by corresponding numerals, and the numerals used to identify elements shown on the right-hand side in FIGS. 1 and 3 will be primed.

A housing is provided which comprises a rear wall 20 and a front wall 21. The rear wall has two projecting tubular members 22 and 22' integral therewith at its upper end and three similar members 23, 24 and 23' integral with the lower end thereof. The front wall 21 carries corresponding tubular projections arranged to mate with their respective members on the rear wall. The corresponding projections at the upper portion of the front wall are designated as 25 and 25' and the lower projections as 26 and 26' (the tubular projection on the front wall corresponding to the member 24 not being shown).

The members 22, 22' and 24 and their corresponding members on the front wall are adapted to accommodate screws 27, 27' and 28, respectively, which serve to rigidly connect the front and rear walls to form a unitary housing. The members 23 and 23' carry guide pins 29 and 29' which are arranged to fit within the corresponding members 26 and 26' on the front wall to further stabilize the housing assembly.

A mounting plate 30 is affixed to the rear wall 20 by any suitable means such as the screws 27, 28 and 27' and a pair of side mounting plates 31 and 31' are affixed thereto by fasteners such as screws 32 and 32'.

In portions of the following description of my invention, reference will be made to the left-hand side only of my escrow cup as shown in FIGS. 1 and 3, since as previously stated the right-hand portion is symmetrical thereto.

The side mounting plate 31 carries a hinge pin 33 and a gate 34 is pivotally suspended at its upper end on said pin. A torsion spring 35 (see FIG. 3) is provided to bias said gate in a counter-clockwise direction towards its closed position (the left-hand gate 34 being shown closed in FIG. 1).

A solenoid 36 is affixed to the mounting plate 31 by fasteners 37 and 38 and said solenoid has a plunger 39 which is urged downwardly by a compression spring 40 mounted thereon. A gate lever 41 is pivotally mounted on the plate 31 by means of a pin 42, said lever being positioned a desired distance from said plate by a spacer 43.

A plate 44 which is integral with the gate 34 projects rearwardly therefrom and has a slot 45 formed therein. The free end of the gate lever 41 carries a pin 46 which is accommodated in said slot whereby counter-clockwise movement of the lever 41 about its axis will cause the gate to be pivoted in a clockwise manner about its hinge 33 towards a vertical or open position (the right-hand

gate 34' is shown in its respective open position in FIG. 1). The lower end of the solenoid plunger 39 is connected to the lever 41 by a pin 47 in such a manner that energization of the solenoid 36 will pull said plunger upwardly and thus effect such counter-clockwise movement of said lever.

It will now be understood that energization of the solenoid 36 will cause the gate 34 to be pivoted about its hinge towards a respective vertical or open position until the lower end of the plate 44 engages a stop 48 which projects forwardly from the mounting plate 31. It will further be understood that upon deenergization of said solenoid the gate 34 will be returned to its closed angular position as shown in FIG. 1 by the action of the torsion spring 35 and the compression spring 40.

It is also important to note that when the gate 34 is in its closed position the gate lever 41 is approximately perpendicular thereto. With such an arrangement the lever 41 serves to positively lock the gate in its closed position so as to prevent the opening thereof other than by energization of the corresponding solenoid.

Reference is now made to FIG. 2 which illustrates in detail the right-hand gate 34'. Said gate has a plurality of semi-circular recesses 49' formed in each side thereof and a plurality of fingers 50' projecting downwardly from its lower end. With reference to the recesses 49', the front and rear walls 20 and 21 are each provided with two groups of arcuate rib members 51 and 51' (the term "arcuate" as used herein is intended to refer to the longitudinal configuration of said ribs and not to their cross-sectional contour) which are arranged to be accommodated within said recesses in closely spaced relation thereto. The left-hand group of rib members 51 (on both the front and the rear walls) cooperate with recesses in the left-hand gate 34 and the right-hand rib members 51' cooperate in a similar manner with the right-hand gate 34'.

In the embodiment shown the rib members are provided by forming arcuate grooves 52 and 52' in the front and rear walls, said grooves being so arranged that the wall portions remaining therebetween comprise the desired ribs. It will be noted that when the gate 34, for example, is pivoted about its hinge 33, the recesses 49 in the sides of the gate move in an arcuate path. Consequently, the ribs associated therewith are formed to have longitudinal configurations which conform respectively to said paths whereby the rib members will be accommodated within their respective recesses for all positions of the gate.

Coin receiving means are illustrated at 53 (see FIG. 1) and said means may simply comprise a divider or guide having two separate coin chutes disposed beneath respective sides of the escrow cup, one leading to a cash box within the associated vending machine and the other to a coin return.

Referring now to the operation of the invention, the gate 34 is shown in its closed angular position in FIGURE 1, and normally both of the gates are locked in their respective closed angular positions so as to form a V-shaped structure which in conjunction with the front and rear walls of the housing provides a cup or container adapted to hold coins directed thereto from above.

It will be noted that the fingers 50 on the gate 34 are staggered with respect to those on the gate 34' so that when the gates are both in closed angular positions the fingers on one gate project between those on the other (see FIG. 3). With such an arrangement the two gates are permitted to overlap one another at their lower ends without forming any crevices long enough to permit a coin to become lodged therein.

Similarly, because of the recesses in the sides of the gates and the corresponding arcuate ribs formed on the front and rear walls of the housing, the gates are free to pivot on their hinge pins and yet no crevices are formed between said gates and walls of a length sufficient to permit a coin to enter.

When coins are deposited on a vending machine in which my escrow cup is embodied they are directed to said cup and are temporarily held therein since both gates are normally locked in their closed positions.

When incorporating this invention in a coin-operated vending machine or the like, one of the two solenoids, 36 for instance, may be arranged to be energized upon delivery of merchandise to a customer. For example, an empty bar (not shown) may be positioned in the path of an article of merchandise being ejected so as to be deflected thereby and thus effect the closing of a switch so as to energize the solenoid 36. The solenoid 36 will then be energized whenever merchandise is delivered and will cause the gate 34 to be pivoted towards its vertical or open position whereby the coins in the escrow cup will be dropped to the chute positioned beneath said gate, which in this instance would lead to a coin box within the vending machine.

Furthermore, the solenoid 36' may be arranged to be energized by actuation of a coin return button placed on the exterior of the vending machine. Energization of the solenoid 36' will cause the gate 34' to be moved towards its open position so as to permit any coins within the cup to be dropped to the chute positioned beneath said gate, which in this instance would be a coin return chute.

This invention can, of course, be applied in various ways and the present description should, thereore, be regarded as disclosing only an illustrative embodiment of the invention from which no unnecessary limitations should be implied.

I claim:

1. An escrow cup for coin-operated vending machines and the like, comprising: a housing including a vertical rear wall and a parallel front wall spaced therefrom; a pair of side gates pivotally suspended on parallel axes perpendicular to said walls, said gates being disposed between said walls in closely spaced relation thereto and being movable to respective closed angular positions so as to form a V-shaped structure which in conjunction with said walls provides a container adapted to hold coins deposited therein; a pair of coin-receiving means, one disposed beneath each of said gates; a pair of gate levers each pivotally mounted at one end and having its other movable end arranged to cooperate with a corresponding one of said gates for pivoting the latter towards a vertical open position upon rotation of said lever, each lever being positioned approximately perendicular to its corresponding gate when said gate is in its closed position so as to act as a brace and thus positively lock said gate against opening; and means for rotating a selected one of said levers to open its corersponding gate whereby any coins within said container will be dropped to a predetermined one of said coin-receiving means.

2. An escrow cup for coin-operated vending machines and the like, comprising: a housing including a vertical wall and a parallel front wall spaced therefrom; a pair of side gates pivotally suspended at their upper ends on parallel axes disposed in the same horizontal plane and perpendicular to said walls, said gates being disposed between said walls in closely spaced relation thereto and being movable to respective closed angular positions so as to form a V-shaped structure which in conjunction with said walls provides a container adapted to hold coins deposited therein; a pair of coin-receiving means, one disposed beneath each of said gates; a pair of gate levers each pivotally mounted at one end and having its other movable end arranged to cooperate with a corresponding one of said gates for pivoting the latter towards a vertical open position upon rotation of said lever, each lever being positioned approximately perpendicular to its corresponding gate when said gate is in its closed position so as to act as a brace and thus positively lock said gate against

opening; and means for rotating a selected one of said levers to open its corresponding gate whereby any coins within said container will be dropped to a predetermined one of said coin-receiving means.

3. An escrow cup for coin-operated vending machines and the like of the type set forth in claim 1 wherein each of said gates has intermittent recess formed in the sides thereof and each of said walls is provided with a plurality of arcuate rib members arranged in two symmetrical groups so as to be accommodated respectively within said recesses in closely spaced relation thereto for all positions of said gates.

4. An escrow cup for coin-operated vending machines and the like of the type set forth in claim 1 wherein each of said gates has intermittent semi-circular recesses formed in the sides thereof and each of said walls is provided with a plurality of semi-circular arcuate rib members arranged in two symmetrical groups so as to be accommodated respectively within said recesses in closely spaced relation thereto for all positions of said gates.

5. An escrow cup for coin-operated vending machines and the like of the type set forth in claim 1 wherein the lower ends of each of said gates carry a group of projecting fingers staggered in such a manner that when said gates are in their respective closed positions the fingers in each group project between those in the other in closely spaced relation.

6. An escrow cup for coin-operated vending machines and the like of the type set forth in claim 1 wherein each of said gates has intermittent recesses formed in the sides thereof and each of said walls is provided with a plurality of arcuate rib members arranged in two symmetrical groups so as to be accommodated respectively within said recesses in closely spaced relation thereto for all positions of said gates and wherein the lower ends of each of said gates carry a group of projecting fingers staggered in such a manner that when said gates are in their respective closed positions the fingers in each group project between those in the other in closely spaced relation.

7. An escrow cup for coin-operated vending machines and the like of the type set forth in claim 2 wherein each gate has affixed to the back thereof a member having a slot therein and each gate lever carries a pin at its movable end arranged to be accommodated in said slot, and wherein said rotating means comprise a pair of solenoids, one arranged to rotate each of said gate levers whereby energization of a selected one of said solenoids will cause the gate associated therewith to be moved towards a vertical open position.

8. An escrow cup for coin-operated vending machines and the like of the type set forth in claim 7 wherein each of said gate levers is arranged to be approximately perpendicular to its respective gate when the latter is in its closed angular position so as to positively lock said gate against opening other than by energization of its corresponding solenoid, and wherein each of said solenoids has a movable plunger which is directly connected to its corresponding gate lever for rotation of the latter.

9. An escrow cup for coin-operated vending machines and the like, comprising: a housing including a vertical rear wall and a parallel front wall spaced therefrom each of which is provided with a plurality of arcuate rib members arranged in two symmetrical groups; a pair of side gates pivotally suspended on parallel axes perpendicular to said walls, said gates being disposed between said walls and being movable to respective closed angular positions so as to form a V-shaped structure which in conjunction with said walls provides a container adapted to hold coins deposited therein, said gates having intermittent recesses formed in the sides thereof to accommodate said arcuate rib members in closely spaced relation thereto for all positions of said gates; a pair of coin-receiving means, one disposed beneath each of said gates; means for normally holding said gates in said closed positions; a pair of gate-opening means, one for pivoting each of said gates towards its vertical open position; and means for actuating a selected one of said gate opening means whereby any coins within said container will be dropped to a predetermined one of said coin-receiving means.

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