United States Patent

Koch

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[54] COIN CONTROLLED LOCKING DEVICE WITH COIN HOLDING MEANS

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[52] **U.S. Cl.** **194/51**
[51] **Int. Cl.** **G07f 5/26**
[58] **Field of Search** ..... 194/45–49, 51, 194/2, 1 B, 1 F, 92

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Primary Examiner—Stanley H. Tollberg
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[57] **ABSTRACT**

Insertion of a coin permits locking of the lock. The coin is retained until the key is inserted and the lock is turned into the open position, in which position the key is secured in the lock and the coin, representing a key deposit returned, or, representing a use fee, is finally collected.

8 Claims, 7 Drawing Figures

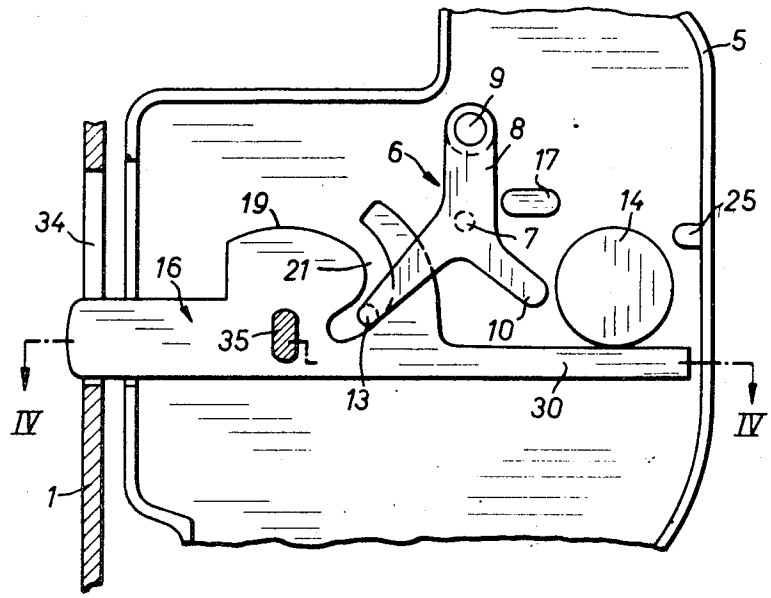
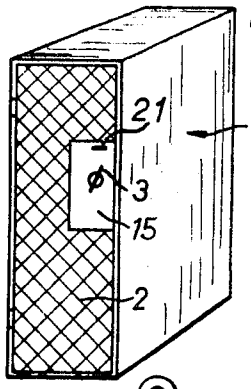


Fig. 1



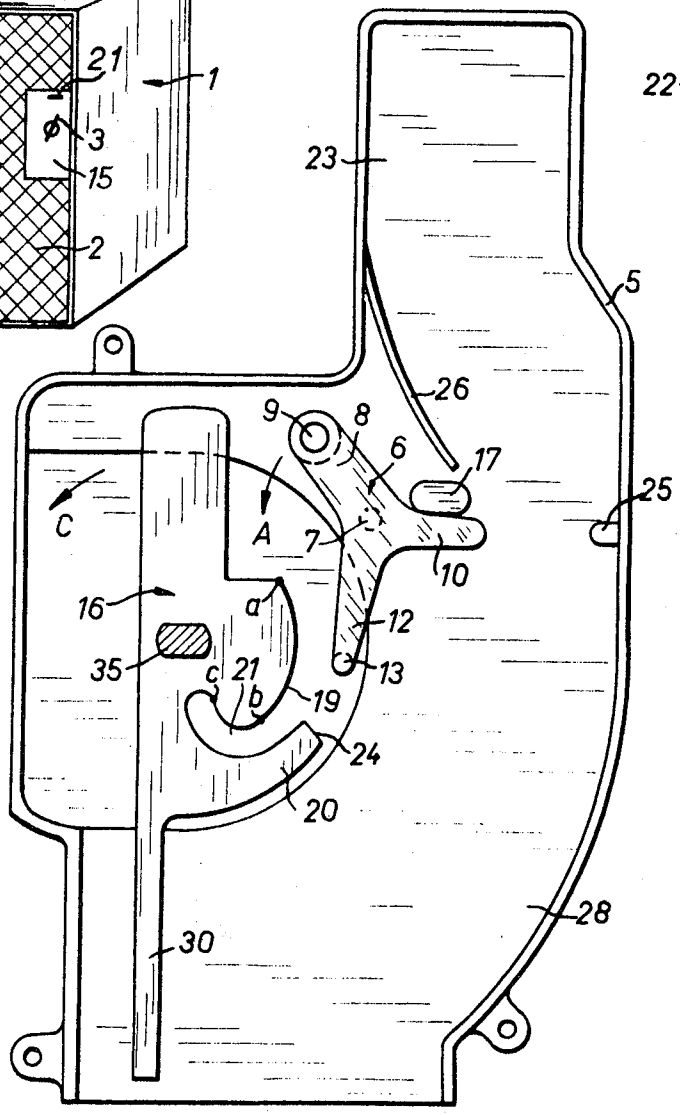


Fig. 2

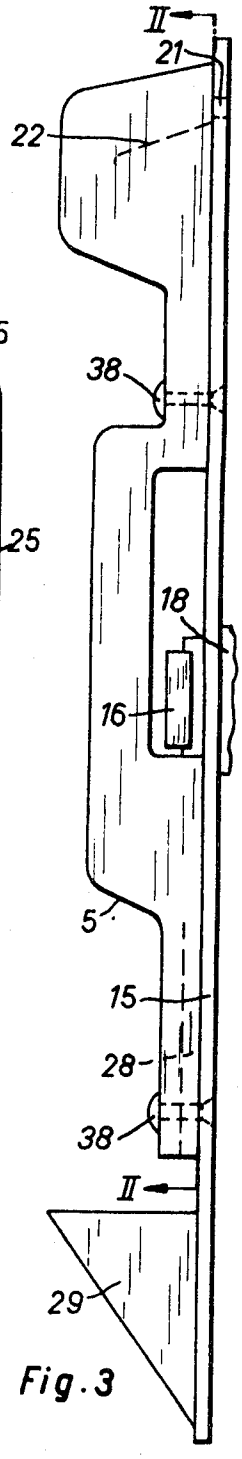


Fig. 3

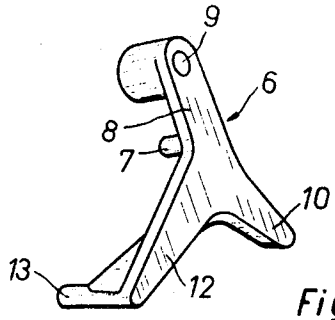


Fig. 7

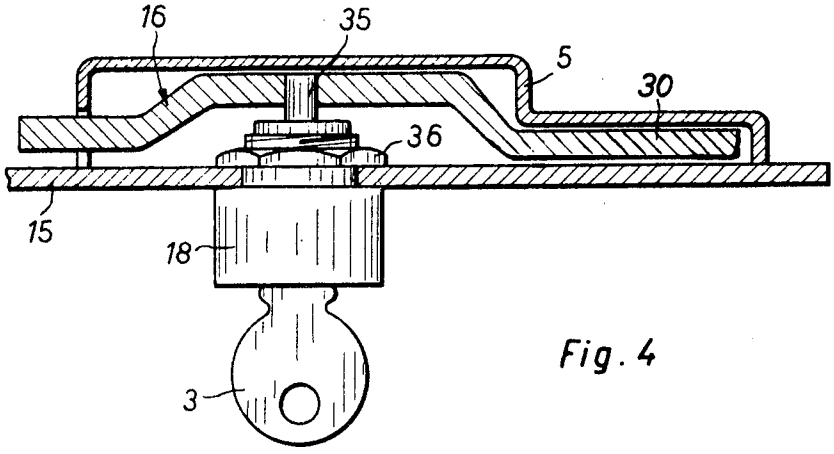


Fig. 4

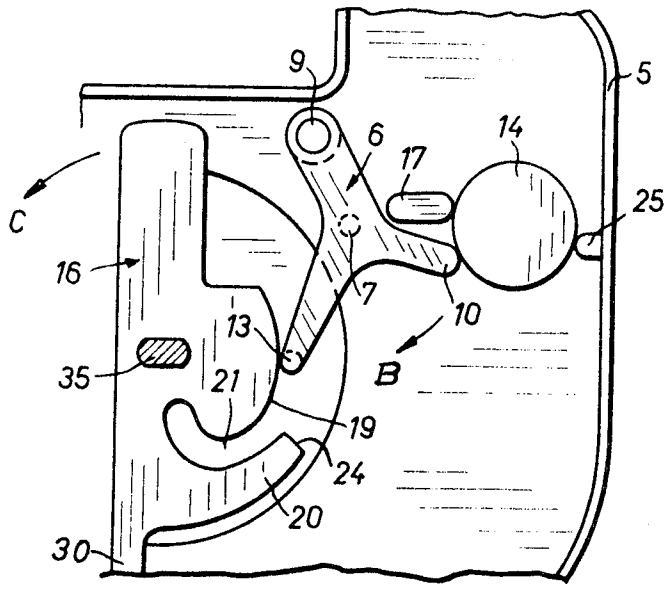

9
5
6
14
17
C
25
16
7
10
13
B
35
21
19
24
20
30

Fig. 5

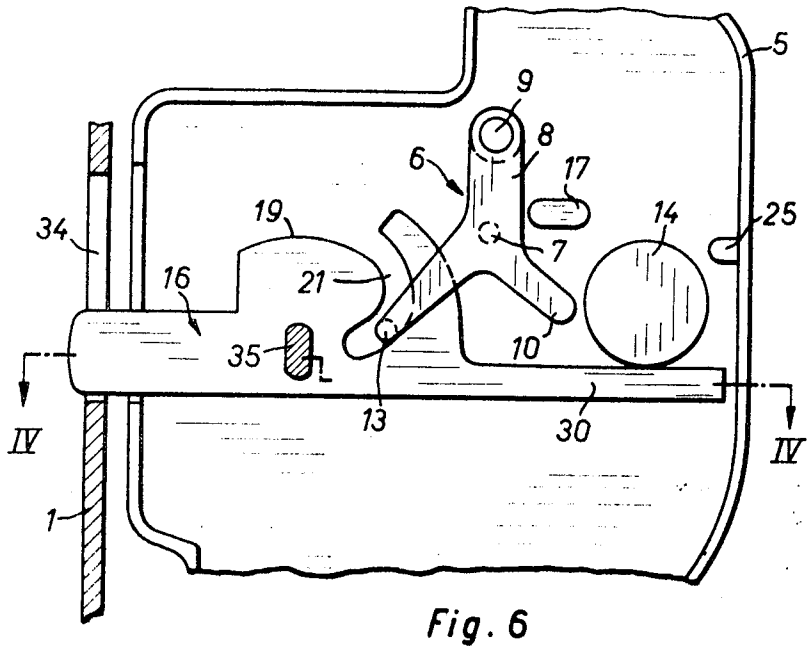

5
9
8
6
17
19
14
25
34
7
16
21
35
10
13
30
IV
IV
1

Fig. 6

COIN CONTROLLED LOCKING DEVICE WITH COIN HOLDING MEANS

This invention generally relates to a coin controlled device and particularly concerns a device for clothing lockers, in which after the insertion of a coin the lock may be brought into the closed position.

Locking devices are already known with a coin controlled device, for example for parcel checking cabinets. It is a disadvantage of these devices that they have a relatively complicated mechanism, and consequently involve high cost for their manufacture.

It is an object of the present invention to provide a simplified and highly economical coin controlled device which has only a few moving parts and which can be made at relatively low cost; and in which the coin controls locking but is, if desired, refunded when the key is again inserted in the lock to represent a key security deposit.

SUBJECT MATTER OF THE INVENTION

Briefly, insertion of a coin permits locking of the lock. The coin is retained until the key is inserted and the lock is turned into the open position, in which position the key is secured in the lock and the coin, representing a key deposit returned, or, representing a use fee, is finally collected.

A pivotable lever is provided which first retains an inserted coin and frees it only when the lock is moved to locking position. The coin continues to be retained in the coin chute, however, by a coin blocking lever which finally frees the coin for refund or collection (as desired) when it is moved in conjunction with opening movement of the lock.

The invention itself as well as further advantageous features thereof will be better understood from the following detailed description of a preferred embodiment, such detailed description making reference to the appended drawing, wherein:

FIG. 1 is a perspective general view of a clothing locker equipped with the locking device according to the invention;

FIG. 2 is a view of the device in the idle position, with the door open, along the line II — II in FIG. 3;

FIG. 3 is a side view of the locking device for fixing to a door;

FIG. 4 is a horizontal section through the locking device along the line IV — IV in FIG. 6;

FIG. 5 is a view similar to FIG. 2, but with inserted coin;

FIG. 6 is a view similar to FIG. 2, but in the locked position of the bolt;

FIG. 7 is a perspective view of the rocking lever.

A clothing locker 1 or cabinet as in FIG. 1 is provided with a coin-in-slot device or coin controlled lock which has the effect that the door 2 can only be locked after a coin has been inserted. Lockers of such a type — a number of which can be arranged one beside another or one upon another — are for example employed for the safe keeping of articles of clothing, for example in open-air or indoor swimming baths. The door 2 of each of these rented lockers may be locked with a key 3, which only fits the lock concerned. The lock 18 is provided with a built-in blocking device which has the effect that the key 3 inserted in the lock 18 can only be withdrawn from the lock when the bolt 16 is in the locked position, that is, in the position illustrated in FIG. 6. In the open position of the bolt however, and also in all intermediate positions, the key 3 inserted in the lock 18 is retained therein and cannot be removed. Further the user of such a clothing locker 1 must first insert a coin before he can bolt the locker or closure door 2 and remove the key belonging to it. This coin represents a security deposit for the key, rather than an amount for use of the locker. The user obtains the refund of his money, serving as a key deposit, after he has opened the compartment and when the key is again duly inserted in the lock. The deposit is only released when the key is again inserted in the lock. The device further permits the locker to be opened as often as is wished and locked again, for example for the depositing or removal of articles of clothing during a rent period, without a new payment being needed on each occasion.

Rigidly fixed to the door 2 is a plate 15, which in its turn carries on the inside of the door a housing 5, attached to the plate 15 by rivets. The plate 15 is provided with a coin-insertion slot 21 for the insertion of coins or deposit tokens. The coin inserted passes by way of an oblique chute 22 into a coin channel 23 formed between the casing 5 and the plate 15 extending downwards from the top. The coin channel 23 is so designed that its longer side in section runs transversely to the axis of rotation of the lock 18. Into this coin channel 23 there penetrates a three-armed rocker lever 6, which is lightly swingable about a bolt 7. The lower arm 12 of this rocker lever 6 is provided with an extension pin 13 running parallel to the axis of rotation of this rocker lever 6. This extension pin 13 is intended to act in conjunction with the rotary bolt 16 and serves as a stop for the locking movement of the bolt 16 when no coin is inserted.

The rocker lever 6 is further provided with an arm 8 extending obliquely upwards, on the upper end of which is located a weight 9, for example in the form of a metal journal, which tends to swing the rocker lever by gravity in the direction indicated by the arrow A. This rotational movement is for the time being prevented by a cam 17 protruding from the casing 5, against which the arm 10 running roughly horizontally from the axis of the rocker lever abuts, so that in its idle position the rocker lever 6 thus takes up the position indicated in FIG. 2. The rocker lever 6 — in accordance with FIG. 7 — preferably consists of a single plastic part, which is supported in an easily rotatable manner with the aid of the bolt 7 carried in a drilling in the casing 5.

The bolt 16 is formed essentially as a two-armed lever and is provided on the one side with a coin hold back extension 30, which serves to hold the inserted coin retained until the bolt has again taken up its open position shown in FIG. 2. In the open position of the rotary bolt 16 the coin then falls into a pocket 29 provided on the inner side of the door, from which the user can retrieve it when the door 2 is opened.

In the idle or open position of the rotary bolt 16 illustrated in FIG. 2, the peg-shaped extension 13 of the rocker lever 6 is located in the path of movement of a cranked lobe 20 of the rotary bolt 16, so that when it is sought to turn the bolt 16 in the direction of the arrow C this extension peg 13 abuts against the face of the shoulder 24, so that turning of the bolt 16 into the locked position is prevented.

Instead of a weight 9, it is also possible for a spring to be present, which tends to pull the rocker lever 6 into the position shown in FIG. 2, in which the peg-shaped extension 13 thus takes up such a position that it abuts against the shoulder face 24 if it is sought to turn the bolt. The lock cylinder which is rotatable by the key 3 extends with its prolongation 35 into the central aperture of the bolt 16 and is secured with this. The lock 18 is rigidly fixed to the plate 15 with the help of an hexagonal nut 36.

When a coin is inserted into the coin channel 23, this coin 14 passes along, led by the guide plate 26, between the two cams 17 and 25. Either as a result of its weight or from the energy of its fall, the coin now effects a swivelling of the rocker lever 6 in the direction indicated by the arrow B (clock-wise direction in FIG. 5), as a result of which the peg-shaped extension 13 is moved to lie against the curved face 19 of the rotary bolt 16. The peg-shaped extension is thus caused to pass into the curved slot 21, so that the rotary bolt 16 is allowed to swing in the direction shown by the arrow C. However the dimensions are such that during a first rotary movement the coin 14 still cannot fall through with the bolt 16 in the position illustrated in FIG. 5, but remains held by the end of the arm 10 on the one side and the cam 25 on the other. Only when the rotary bolt 16 is turned fully in the locking direction — that is, in the direction indicated by the arrow C — does the pin 13 pass into the slot 21 and shortly before reaching the terminal position of the rotary bolt 16 as illustrated in FIG. 6 the rotary bolt 16 releases the coin 14. This effect is obtained because the curve 19 has a varying radial distance from the axis of rotation of the bolt 16. That part of

the curve **19** between the points *a* and *b* (FIG. **2**) is formed as an arc of a circle, the center of the radius of which lies on the axis of rotation of the bolt **16**. The following part of this curve **19** on the other hand, that between the points *b and c*, runs generally in an arched or spirally inwards directed path about the axis of rotation of the bolt **16**. This part of the curve has a smaller radial distance from the pivoting axis of the rotary bolt **16**. As long as the peg **13** slides along the part of the curve *a – b* while the bolt **16** is being turned, the rotational position of the rocker lever **6** remains unaltered and the coin **14** is prevented from dropping through the arm **10**. But as soon as the peg **13** comes to lie against the part of the curve *b – c*, the rocker lever **6** is moved in the direction shown by the arrow B and as a result releases the coin **14**. The coin is for the time being held up further down by the coin-catching extension **30**, as can be seen from FIG. **6**. In the locked position of the rotary bolt **16** it engages in the bolt aperture **34** of the casing **1**, so that the closed door is now bolted and the key **3** can be withdrawn. The rotary bolt **16**, the coin-catching extension **30**, the part carrying the curve **19** and the tongue **20** are forming a single piece which is rotationally linked to the prolongation **35** of the lock cylinder.

If the door has to be opened again, the key **3** is inserted in the lock **18** and turned in the opening direction. Since in so doing the rotary bolt **16** and with it the coin-catching elongated extension **30** swings around, the coin **14** now falls down along the channel **28**, best seen in FIG. **2**, and finally arrives in the collector pocket **29** on the inside of the door **2**. The channel **28** has a curved peripheral rim. The radius of the rim is slightly greater than the length of said coin-catching extension from the pivoting axis of the rotary bolt **16**. With the door open, the coin can be removed from here. The key **3** is held retained in the lock **18** and secured against being withdrawn, as soon as the rotary bolt leaves its locking position as shown in FIG. **6**. In this way it is ensured that the deposited coin is not released before the key is actually inserted and secured in the lock **18**. Misuse in the form of the key being turned into the locked position with the door open and both the deposit money and also the key then being taken away is prevented in this way.

If the door **2** is to be locked again, then a coin is again inserted in the coin-slot **21**, so that the rotary bolt **16** can then again be swung in the direction indicated by the arrow C and the door **2** may again be bolted or locked.

The coin is checked by the verification of its diameter, in that coins **14** which are too small fall between the cam **25** and the arm **10** without holding the rocker lever **6** in its bolt releasing position. Coins which are too large are already rejected by the size of the coin slot **21**. It is however still possible to incorporate additional coin-checking components, as those are commercially obtainable.

It is also possible for the device described to be fixed to the anchored door frame or marginal portion instead of attaching it to the door, allowing the rotary bolt to engage in the door.

A further variant consists in the provision of a lockable coin box instead of the removal pocket **29**, when no provision is to be made for the return of the coins inserted.

Besides clothing lockers, this device can also be applied to other rented cabinets or containers, such as parcel checking cabinets.

As should now be apparent, the objects initially set forth at the outset of this specification have been successfully achieved. Accordingly,

What is claimed is:

1. A coin controlled locking device, in which the lock can be brought from the open position into the closed position after the insertion of a coin, comprising

door locking bolt means (**16**) mounted for movement forwardly and rearwardly to door locking (FIG. **6**) and released (FIG. **2**) positions respectively;

pivotable lever means (**6**) cooperating with said locking bolt means having normally a position in which said locking bolt means is prevented from moving into closed position;

coin receiving channel means (**23**);

said lever means extending into said coin receiving channel means so that an inserted coin effects a turning movement of said lever means into a releasing position with respect to said locking bolt means;

stop means (**19**) for limiting the swinging amplitude of said lever means, said stop means being operatively connected to said locking bolt means and releasing the inserted coin after said locking bolt means has left its open position;

and coin blocking means (**30**) operatively associated and movable with the locking bolt means, said coin operated blocking means, when the locking bolt means is in closed position, being located to extend into the coin receiving channel means below the normal position of said pivotable lever means to inhibit travel of a coin through the channel, and being movable to unblock the coin channel and permit travel of the coin through said channel, when the locking bolt means is in open position.

2. A coin controlled locking device as defined in claim **1**, wherein said stop means contains a first curved part being substantially an arc of a circle having a radial center point located substantially on the pivoting axis of said locking bolt means, said stop means further containing a subsequent second curved part having a smaller radial distance from the pivoting axis of said locking bolt means.

3. A coin controlled locking device as defined in claim **1**, wherein said locking bolt means is a two-armed lever, one of said arms forming said coin blocking means and extending in the closed position of said locking belt means into said channel means below said pivotable lever means for catching the falling coin and release it but shortly before said rotatably mounted locking bolt means has arrived at its terminal open position.

4. A coin controlled locking device as defined in claim **1**, wherein said locking bolt means is provided with a radial shoulder, for coacting with said lever means to stop the movement of said lever means when said locking bolt is in its open position.

5. A coin controlled locking device as defined in claim **1**, wherein said locking bolt means has an abutment shoulder located at the end of a curved tongue of said locking bolt means, said curved tongue delimiting a curved groove, a part of said pivotal lever means extending in axial direction and being intended to be engaged by said groove during movement of said locking bolt means from said open position to said closed position.

6. A coin controlled locking device as defined in claim **1**, wherein said locking bolt means carries as a single piece a bolt, an elongated coin catching extension, said extension forming said coin blocking means, a curved member and a tongue, said locking bolt means being secured to a prolongated part of a lock cylinder.

7. A coin controlled locking device as defined in claim **1**, wherein said lever means is holding an inserted coin when said locking bolt means is in open position, said coin blocking means comprising an elongated arm extending into said channel means at least in the closed position of said locking bolt means, said arm holding a coin dropped by gravity after release by said lever means at a lower level when the arm is in the coin-inhibiting position corresponding to the closed position of said locking bolt means.

8. A cabinet having a door and a coin controlled locking device, comprising

door locking bolt means mounted for pivotable movement to door locking and released positions respectively,

pivotable lever means cooperating with said locking bolt means and being normally in a position in which said locking bolt means is prevented from moving into its closed position,

coin receiving channel means, said lever leans extending into said coin receiving channel means so that an inserted coin effects a turning movement of said lever means into a releasing position with respect to said locking bolt means,

stop means for limiting the swinging amplitude of said lever means, said stop means being operatively connected to said locking bolt means and releasing the inserted coin after said locking bolt means has left its open position,

and coin blocking means (**30**) operatively associated and movable with the locking bolt means, said coin operated blocking means, when the locking bolt means is in closed position, being located to extend into the coin receiving channel means below the normal position of said pivotable lever means to inhibit travel of a coin through the channel, and being movable to unblock the coin channel and permit travel of the coin through said channel, when the locking bolt means is in open position, and

a coin collecting pocket arranged below said channel means, said pocket being freely accessible from the inside of said door;

said coin receiving channel means extending from below said coin blocking means to said coin collecting pocket.

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