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C. B. A. PORTER

3,363,736

TICKET VENDING MACHINES

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3 Sheets-Sheet 2

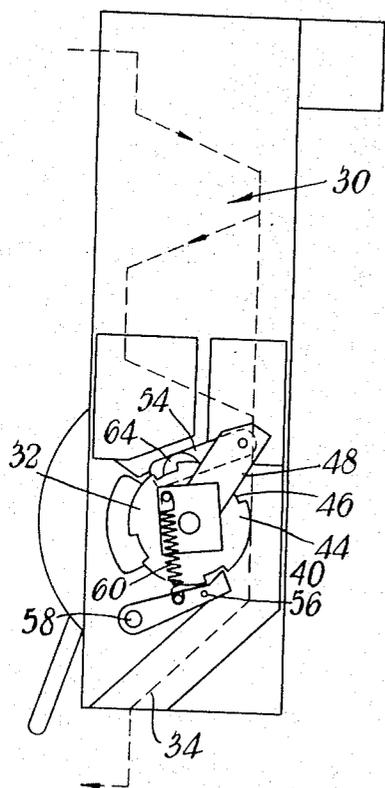


FIG. 3

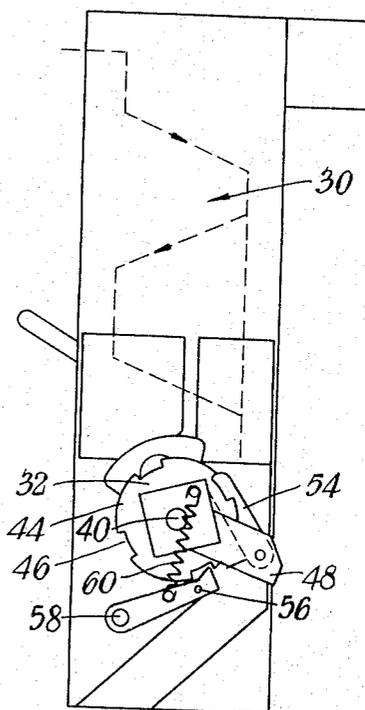


FIG. 4

INVENTOR
CHARLES B. A. PORTER

BY *Larson and Jaynes*

ATTORNEYS

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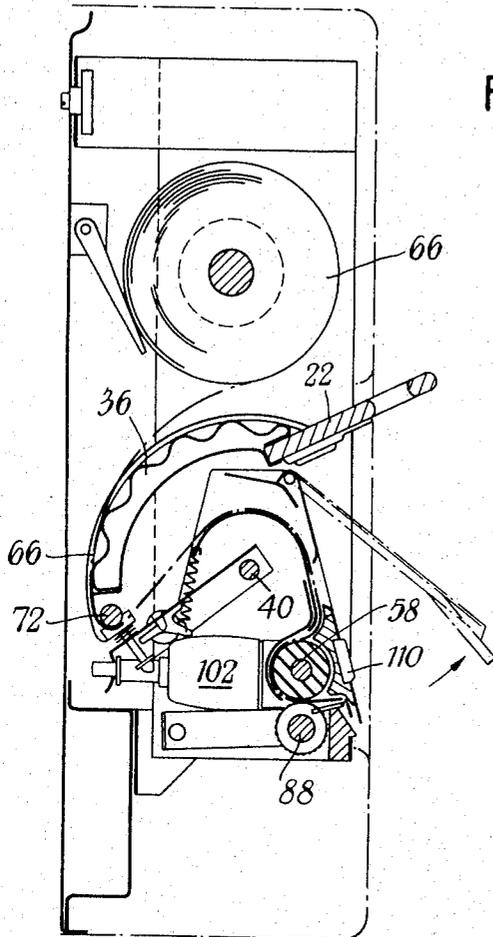


FIG. 5

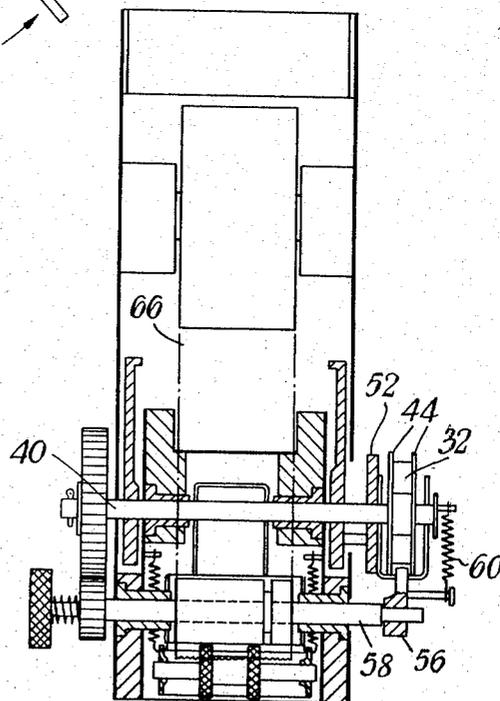


FIG. 6

INVENTOR
CHARLES B. A. PORTER

BY *Larson and Jayles*
ATTORNEYS

3,363,736

TICKET VENDING MACHINES

Charles B. A. Porter, Bath, Somerset, England, assignor to Autonumis Limited

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ABSTRACT OF THE DISCLOSURE

A ticket vending machine including a frame, a web roll storage mechanism in the frame and guide members to define a feed path for the web from the storage mechanism to a delivery outlet opening. A portion of the feed path includes an aperture opening through to the web, through which a personal identifying mark can be applied to the web material. A movable door is mounted in the frame for movement from a first position where it covers the aperture to a second position where it exposes the aperture. As the door moves from the second position to the first position it causes a portion of the web in the feed path exposed through the aperture to be removed from the machine through the delivery outlet opening. A coin freed mechanism is included to latch the movable door in the first or closed position until released by the insertion of a predetermined number of coins.

The machine further includes suitable devices for placing a date stamp on the portion of the web being fed through the delivery outlet opening and a counting device for counting the number of times that the door is moved from the first position to the second position.

The invention relates to a vending machine of the kind designed to deliver a ticket on insertion of a predetermined sum of money.

The invention particularly relates to machines for delivering tickets which are non-transferable, that is, unambiguously associated with a particular individual, normally the purchaser. Such non-transferable tickets are required for example in connection with the sale of insurance by machine as for example at airports and ski-lifts. The ticket then normally provides the holder with a short term insurance policy, covering one day's air travel or skiing, and is in effect an insurance voucher or certificate. The word "ticket" is however used herein broadly to cover all such means for entitling a designated person to some benefit or right.

It is thus an object of the invention to provide a machine for delivering, on insertion of a predetermined sum of money, a ticket which can be unambiguously associated with a particular individual.

It is a further object of the invention to provide such a machine, in which insertion of a suitable coin or coins, initiates or permits the purchaser to initiate predetermined functions of the machine of which the last is the delivery of the ticket, an intermediate function being exposure of the ticket for the application thereto of a personal identifying mark, such as a finger print. It is a further object of the invention to provide such a machine in which the purchaser is required to supply the power for operation of the machine.

The invention accordingly provides a machine for vending tickets, the machine comprising means supporting a supply of record material, the material being adapted to receive a personal identifying characteristic, means manually movable after insertion of a predetermined sum of money to expose a portion of the record material for application thereto of a personal identifying characteristic, and means operable to deliver for removal from the ma-

chine a ticket which can be identified with the characteristic.

Preferably the personal identifying characteristic is a finger print, which term is herein used to include a thumb print. The delivered ticket is conveniently a portion of the record material bearing the identifying characteristic, but this can be retained, the ticket issued being associated with this portion as by common numbering. Means for date and/or time stamping the ticket can be incorporated in the machine.

According to one embodiment, a machine for selling tickets comprises means supporting a supply of record material, guide means for guiding material from the supply to a delivery zone, an aperture in the guide means for exposing a portion of the material, door means covering the aperture in closed position and operable on insertion in the apparatus of a predetermined sum of money to permit access to the aperture for application to the portion of the record material exposed thereby of a personal identification characteristic, a feeding means operable on closure of the door means to feed the delivery zone the portion of the record material having the characteristic thereon.

The machine will normally incorporate coin testing, clearance and collection means as is usual with vending apparatus.

Other objects, features and advantages of the invention will become apparent from the following description which is given not to imply any limitation to the invention but solely by way of example.

In the drawings:

FIGURES 1 and 2 are respectively side and front views of an illustrative machine embodying the machine in the condition prior to going through a ticket issuing cycle;

FIGURES 3 and 4 are side views of the mechanism of the machine opposite to the side view of FIGURE 1, respectively in the initial and intermediate condition of a ticket issuing cycle; and

FIGURES 5 and 6 are views of the machine corresponding to FIGURES 1 and 2 in the intermediate condition of FIGURE 4.

The machine 10 shown in the drawings includes a frame 12 on which the mechanism is supported and which is mounted within a housing 14. The housing comprises a back plate 16 arranged to be secured to a wall or other vertical surface and a generally upright rectangular cover 18 providing side, top and bottom portions and a front face portion. The front face portion is apertured to provide at the top a coin slot (not shown) on one side and an area (not shown) on which instructions for use can be displayed. Below is a door 20 with a handle 22. At the bottom of the face portion is a slot 24 from which tickets are delivered and on one side below the coin slot, an outlet (not shown) for refunded coins.

The back plate 16 mounts a bracket 26 having a hinge pin 26a mounted thereon for supporting hinge forks 12a at the base of the frame 12 so as to permit the frame to pivot forwardly about the hinge pin 26a into a generally horizontal position to facilitate servicing and re-loading. At the top, the frame 12 is secured to the back plate by a turnbuckle latch 28 which can be received through a slot 29 in the frame but which can be turned from the locking position only when the frame is lifted slightly from the hinge pin 26a, this movement being permitted by the hinge forks 12a. This ensures that the frame 12 will be supported as the latch 28 is released, to avoid any danger that it will simply fall forward on release.

It will be appreciated that the coin slot will normally lead to a coin tester or selector mechanism indicated at 30 and providing a path to the coin receiver 32 in the mechanism for coins of the correct kind and arranged to divert

other coins to a refund path 34 leading to the refund outlet. Where the machine is required to be operated only on insertion of a plurality of coins, there can be provided between the selector and the receiver a refund unit, which is arranged to refund one or more accepted coins if the total required is not completed. A cam or the like can be arranged to operate the refund unit on an attempt to open the door 20, a small movement of the door being available for use for this purpose. A mechanism for giving change could be included.

The door 20 has a portion 36 which is part cylindrical in general form and outwardly convex. The door is pivoted about its axis by side plates 38 freely journalled on a main shaft 40 which extends transversely across the machine through apertures in side support walls 42, of the frame 12. The handle 22 has the form of a radially projecting flap provided at the foot of the door. At the end of the main shaft 40 on the coin slot side, which is the right-hand side of FIGURE 2, the shaft carries the coin receiver 32 in the form of two circular ratchet discs 44 having four notches 46 equally spaced about their peripheries. The discs have between them means 45 defining four coin pockets shaped to co-operate with the notches 46 in a way to be described. The coin receiver lies between the arms of a generally U-shaped pawl carrier 48 secured to rotate on the main shaft 40 together with the door 20, by means of a link 50 extending between the right-hand side plate 38 of the door and a member 52 connected to the left-hand limb of carrier 48. The pawl 54, also generally U-shaped, is pivoted at the outer end of the carrier 48 and spring-urged to engage its free end, which projects towards the front of the housing, in the notches 46 of the ratchet discs.

Before coin insertion, an attempt to swing up the door 20 is thwarted, after a small movement, by engagement of the free end of the pawl 54 with the end of the particular notch 46 in which it is engaged, the coin receiver discs 44 being held against rotation in the door-opening direction by a back stop lever 56 pivoted on a shaft 58 and urged by a spring 60 to engage a notch in the coin receiver discs 44 so as to act as the non-return ratchet stop. The spring 60 is connected at its other end to a member 62 movable with the door, so that the spring 60 also acts as a toggle spring tending to maintain the door open or closed. With the appropriate coin or coins 64 lodged in the receiver (FIGURES 3 or 4), however, the pawl 54 can ride free of the notch over the rim of the coin, permitting the door to be fully opened, a rotation through about 90°. The door opening movement, which the user is instructed to perform after coin insertion makes it possible, and which is assisted to completion by the spring 60, effects performance of two functions as follows:

The first function relates to ticket feeding. Tickets are formed from a roll of the strip 66 mounted at the top of the housing on a shaft 68 journalled in fittings 70 on the side plates 42. The strip is threaded downwardly behind a pay out roller 72 carried at the upper end of the door structure and then forwardly and downwardly behind the door, through fixed arcuate guide means in the form of curved plates 74, 76 defining a ticket guide slot between them. The outer plate 74 has a print aperture 78 exposing the central part of the strip 66 to the user when the door is open.

At the lower outlet end of the guide means, a concave surface 80 having its axis extending across the machine, urges the strip rearwardly onto the top of a drive roller 82, of hard rubber, carried by the shaft 58. Extending down from the back of the guide means around the back of the roller are a pair of spaced apart spring metal guide arms 84. The strip 66 is carried by the arms 84 round the drive roller 82 onto the nip between it and a pair of knurled or milled discs 86 which function as pressure rollers.

The discs 86 are mounted for free rotation on a shaft 88 carried at the end of the arms 90 pivoted towards the rear of the machine and spring urged by spring 92 to bring the discs into engagement with the drive roller 82; to ensure positive controlled delivery, the spring tension can be sufficiently great to mark the material of the strip with the pattern of the knurling discs 86.

The ticket strip 66 proceeds forwardly from between the nip to a further concave surface 94 which directs it downwardly and forwardly under a serrated cutter blade 96 at the delivery slot 24 against which the issued ticket can be torn off by the purchaser. The serrated blade 96 can have its edge in the shape of a very flattened V to facilitate tearing.

The first function mentioned is thus the action of the coil pay out roller 72, resulting from its backward movement on opening of the door 20, in extending the effective path of the strip 66 between the ticket roll and the guide means 74, 76 so as to pay out a length of strip from the roll. The portion of the strip in the guide means is unaffected, its end being securely held between the drive roller 82 and the knurled discs 86.

The second function is the date stamping of the ticket to be issued. Pivoted on the main shaft 40 is a rearwardly projecting lever 98 having the plunger arm 100 of a date stamp mechanism pivotally connected at its free end. The arm 100 extends forwardly to the actual stamp mechanism 102 which is held so as to be normally slightly spaced from the ticket strip entrained round the drive roller 82. The payout roller 72 carried on the door structure is arranged to function also as a striker means for engaging the lever 98 as the door opens to cause it to pivot and operate the date stamp. The upper side of the free end of the lever 98 is for this purpose provided with a headed peg of which the shank 102a is surrounded by a coil spring 104 between the arm 98 and the head 106 arranged to urge the arm and head apart. The head 106 is transversely grooved to receive the roller 72 with the strip 66 around it. After the spring 104 has been put under maximum compression by the roller 72, the arm 98 is pivoted downwardly.

With the door 20 fully opened, so that these two functions have been performed, the mechanism is in a half-stage-position as shown in FIGURES 4-6, in which the step by which the ticket is rendered non-transferable can take place. The surface of the ticket roll exposed through the print aperture 78 is specially prepared so that a finger or thumb moistened with a particular liquid and pressed against the surface leaves an indelible print thereon. The two concave surfaces 80 and 94 of the ticket feed means are provided by a single paper guide block 108 which carries on its front surface a transfer pad 110 impregnated with a suitable liquid, preferably colourless. A finger applied to the transfer pad 110 will pick up sufficient liquid for forming a finger print on the ticket. A storage pad 112 containing the liquid is mounted on the back of the handle portion 22 of the door 20 in a position to engage the transfer pad when the door is closed.

The door 20 being opened to expose both the transfer pad 110 and the print aperture, the purchaser of the ticket presses a finger on the pad and then on the ticket, in accordance with the instructions. The coating of the ticket strip 66 so as to produce a print on being moistened by certain liquids is not a part of the present invention, which can employ any suitable finger printing technique.

To obtain the ticket, the purchaser is instructed next to close the door 20 which restores the mechanism to its initial condition from the half-stage position. The return movement of the door structure withdraws the date stamp mechanism 102 from engagement with the ticket and releases the upper length of the ticket strip from engagement by the coil pay-out roller 72. It also effects an equivalent rotation of the main shaft 40. The pawl 54 has been lifted by the door opening movement over the rim of the coin or coins 64 in the carrier 32 into an

adjacent notch 64 of the ratchet discs 44, so that the door closing movement causes the pawl to carry these discs with it, so effecting a 90° rotation of the main shaft 40.

This rotation effects two functions. Firstly the coin or coins 64 in the carrier are tipped out and fall into a coin box (not shown) at the bottom of the housing 10. Secondly, by means of meshing gears 115, 116 carried respectively by the main shaft 40 and the shaft 58 on which the drive roller 82 is mounted, this roller is rotated so as to feed a length of the ticket strip 66 corresponding to a single ticket out through the delivery slot 24. The length fed out of course carries on opposite sides the printed date and the finger print. Information regarding the conditions under which the ticket has been issued can be pre-printed on the ticket roll. To avoid the necessity for registration, this printing can be arranged so that the length of the roll issued as a ticket can readily be seen to contain a complete text, not necessarily in continuous form. The ticket feeding movement will, of course, take up the slack in the ticket strip caused by the movement of the coil pay out roller 72 during the door opening movement.

The ticket issuing cycle has then been completed and the machine is ready to begin another cycle on insertion of the required coins.

The ticket strip feeding means described facilitate insertion of a new strip, which can simply be pushed down between the guide plates 74, 76. The end of the new strip will then be directed by the first concave surface 80 and guide arms 84 round the drive roller 82 to the nip formed with the knurled discs 86. To permit feeding of the strip end into the nip, the gear connection between the main shaft 40 and the drive roller shaft 58 operates through a coil spring clutch unit 118 around the latter shaft. The gear on the main shaft 40 is provided with non-return ratchet control and the roller shaft 58 is provided with a knob 120 so that it can be manually rotated during the loading operation to feed the strip end into the nip.

To prevent overrunning of the shaft 68 on which the ticket roll is mounted, the back plate 16 can carry a spring-loaded flap 121 arranged to engage the roll, and act as a brake.

A counter 114, for example, a ratchet type counter, is included in the mechanism; it is mounted on the rearwardly projecting lever 98 actuating the date stamp 102, so as to be operated and re-set each time the opening of the door engages the pay-out roller 72 with the member 106 carried by this lever to effect the date stamping function.

As will be apparent, the machines described can be modified within the invention in numerous ways both major and minor. The various functions can be performed by a large variety of suitable alternative mechanisms, and some functions, for example date stamping, can be performed at different times during the cycle, or in a different order. Again, some functions can be varied or omitted. Instead of or in addition to date stamping, for example, a number could be printed on the ticket or the finger print could appear alone. It is convenient to arrange for operation of the machine by opening and closing of the door but the door could open freely or even be omitted and the mechanism then operated by a handle, a lever or a knob or a combination of these. The embodiment described is convenient for all locations in being entirely mechanical in its operation, but if dependence on an electrical supply is not a disadvantage, the power for performing the functions of the machine can readily be provided electrically.

Further modifications can include provision of a mechanical check which requires to be released by pressure on the ticket strip through the print aperture before delivery of the ticket can take place; this presents a difficulty to persons intending to buy a ticket and apply the

identifying mark subsequently. The machine could instead include a roll of material arranged to receive a finger print and to be retained inside the machine a ticket being delivered from a separate roll and associated with the retained finger print as by a common numbering of the ticket and the portion of the first roll bearing the print.

What is claimed is:

1. A ticket vending machine, comprising in combination a support frame, storage means mounted in said support frame for storing a web of record material, feed path defining means in said frame for defining a feed path for said web from said storage means to a delivery opening through which an end of the web is removable from the frame, feeding means mounted in said support frame for feeding said web record material along said feed path, said feed path defining means including means for defining an aperture opening into said feed path for permitting the application of a personal identifying characteristic to an end portion of said web exposed through the aperture, a manually movable door structure, mounting means for mounting said door structure in said support frame for movement between a first position whereat the door covers and prevents access to said aperture and a second position whereat the door permits access to said aperture, means for operatively connecting said mounting means to said feeding for causing feeding of said web during movement of said door structure from said second to said first position to discharge said web end portion through said delivery opening, and a coin freed latching mechanism connected to said mounting means for preventing movement of said door structure from said first position before the insertion in said mechanism of a predetermined number of coins.

2. A ticket vending machine as claimed in claim 1, in which the said mounting means is arranged to permit movement of said door structure through the line of feed of said web between said storage means and said delivery opening.

3. A ticket vending machine as claimed in claim 2, including a roller mounted on said door structure for engagement with the web as the door structure moves through the line of feed of the web.

4. A ticket vending machine as claimed in claim 1, and further comprising a date stamp mounted in said support frame adjacent to the line of feed of said web, means for normally biasing said date stamp to an inoperative position away from the line of feed of the web, and actuating means mounted on said door structure for actuating said date stamp to print on said web when the door structure is moved into said second position.

5. A ticket vending machine as claimed in claim 4, and further comprising means for mounting said date stamp for pivotal movement with said door structure when the latter moves to said second position.

6. A ticket vending machine as claimed in claim 4 and further comprising a counter means mounted for operation to register one count for each actuation of the date stamp.

7. A ticket vending machine as claimed in claim 1 and further comprising retaining means for retaining a film of impression liquid, said retaining means being mounted for exposure only upon movement of said door structure to said second position.

8. A ticket vending machine as claimed in claim 7 and further comprising liquid storage means for said impression liquid, said liquid means being mounted on said door structure for engagement with said retaining means and replenishment of said film when said door structure is in said first position.

9. A ticket vending machine as claimed in claim 1 wherein said feeding means comprise a hard rubber roller operatively connected to said door mounting means for

rotation only in a direction to feed said web end portion towards said delivery position, and a pair of axially spaced knurled discs engageable with said roller.

10. A ticket vending machine, comprising in combination a support frame, a storage reel for a rolled web of record material, first and second feed roller means for engaging and feeding said material between two guide plates defining a feed path therefor and thence to a delivery outlet for removal of an end of said web from the frame, one of said guide plates also having means for defining an aperture for permitting the application of an identifying mark to an end portion of said web of record material exposed through said aperture, a manually movable door structure, a first shaft mounting said door structure for pivotal movement between a first position whereat the door prevents access to said aperture and a second position whereat the door permits such access, a second shaft mounting said first feed roller, bearing means in said support frame for said first and second shafts, gears mounted on said first and second shafts and in driving relationship with each other so that movement of the said door from said second position to said first position causes removal of said web end portion through said delivery opening, and a coin feed latching mechanism connected to said first shaft for preventing rotation of said first shaft before the insertion in said mechanism of a predetermined number of coins.

11. A ticket vending machine, comprising in combination a support frame, a storage reel for a roll of record material, a spring biased arm mounted on said frame for abutment with said roll of record material, feeding means comprising a rubber roller and two knurled discs mounted in rolling engagement therewith for engaging and feeding said record material between a first guide plate defining a support therefor and a second guide plate defining an aperture for permitting the application of a fingerprint to a portion of said record material exposed through said aperture, and thence to a delivery for detachment of an end portion thereof, a first shaft, bearings mounting said first shaft in said support frame, a door structure mounted for manual movement with said first shaft between a first position preventing access to said aperture and a second position permitting such access, said door structure comprising side walls secured to said shaft and an arcuate door face, secured between said side wall, retaining means for retaining a film of impression liquid, said retaining means being mounted on said second guide plate for exposure only upon movement of said door structure to said second position, storage means for storing said impression liquid, said storage means being mounted on said door structure for engagement with said retaining means and replenishment of said film when said door structure is in said first position, a second shaft mounting said rubber roller, bearing means in said support

frame for supporting said second shaft, a date stamp mounted in said support frame for movement along an arcuate path concentric with that of said second shaft and having a type face defining with said rubber roller part of the feed path of said record medium, means normally biasing said date stamp into an inoperative position, actuating means mounted on said door structure for actuating said date stamp to print on said record medium when said door structure is moved to said second position, a counter mounted to register one count for each actuation of the date stamp, gears mounted on each of said first and second shafts and intermeshing, and a coin freed mechanism connected to said first shaft for preventing rotation of said first shaft before the insertion in said mechanism of a predetermined number of coins.

12. A ticket vending machine having support means for supporting a rolled strip of elongated record material adapted to permanently record the print of a finger moistened with an impression liquid and applied to the material, a pair of guide plates, means for spacing apart the guide plates to provide therebetween a guide slot for the strip, said slot having an entry end adjacent the supporting means and an exit end remote therefrom, an aperture in one of the guide plates for exposing at least a major portion of the width of the strip, a pair of roller means adjacent the slot exit and adapted to cooperate with each other for feeding the strip therebetween to a delivery zone, a pad impregnated with the impression liquid, a door mounting means for mounting the door for movement between a closed position wherein the door covers the aperture and the pad and an open position in which the aperture and pad are exposed, a coin release mechanism adapted to normally retain the door in closed position and to release the door for movement to the open position in reception by the mechanism of a predetermined coin, and means linking the door and one of the roller means so that closure of the door effects feeding to the delivery zone of a length of the strip including the portion exposed at the aperture prior to the door closure and opening of the door has no effect on the roller means.

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55 STANLEY H. TOLLBERG, *Primary Examiner.*