

[54] **VENDING MACHINE WITH COUNTING MECHANISM**

[75] Inventor: **Waldo E. Bolen, Morris, Ill.**

[73] Assignee: **The Northwestern Corporation, Morris, Ill.**

[22] Filed: **Mar. 9, 1972**

[21] Appl. No.: **233,080**

[52] U.S. Cl. **194/2, 221/7**

[51] Int. Cl. **G07f 11/00**

[58] Field of Search **221/7, 265; 194/2, 194/63; 222/36**

[56] **References Cited**
UNITED STATES PATENTS

1,355,583	10/1920	Zeidler et al.	221/7 X
2,652,916	9/1953	Mason	194/63
3,047,347	7/1962	Groves	221/7 X
3,604,547	9/1971	Bolen	194/2

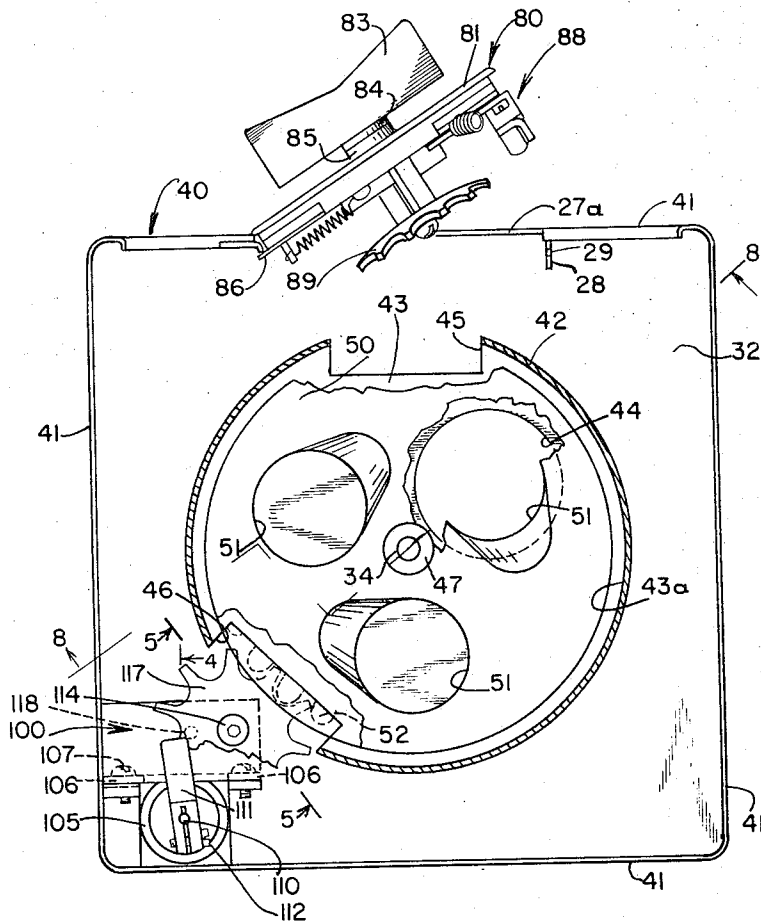
3,561,579 2/1971 Allison 194/63 X

Primary Examiner—Robert B. Reeves
Assistant Examiner—Francis J. Bartuska
Attorney—Prangley, Dithman, Vogel, Sandler & Stotland

[57] **ABSTRACT**

A vending machine has a hollow base and a merchandise container supported thereby. A coin-actuated mechanism is preferably mounted on the front wall of the base and is arranged to operate a wheel which dispenses merchandise. A counting mechanism is mounted in the base and is operatively coupled to the dispensing wheel in such a manner that the counting mechanism is visible through an opening in the rear of the base. Thus, the counting mechanism does not interfere with servicing of the coin-actuated mechanism and also is visible without gaining access to the interior of the vending machine.

8 Claims, 8 Drawing Figures



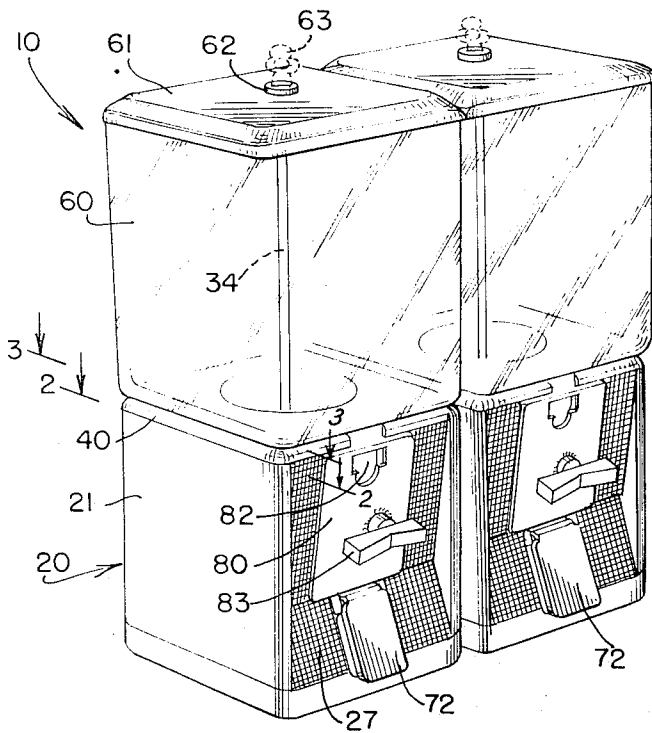


FIG. 1

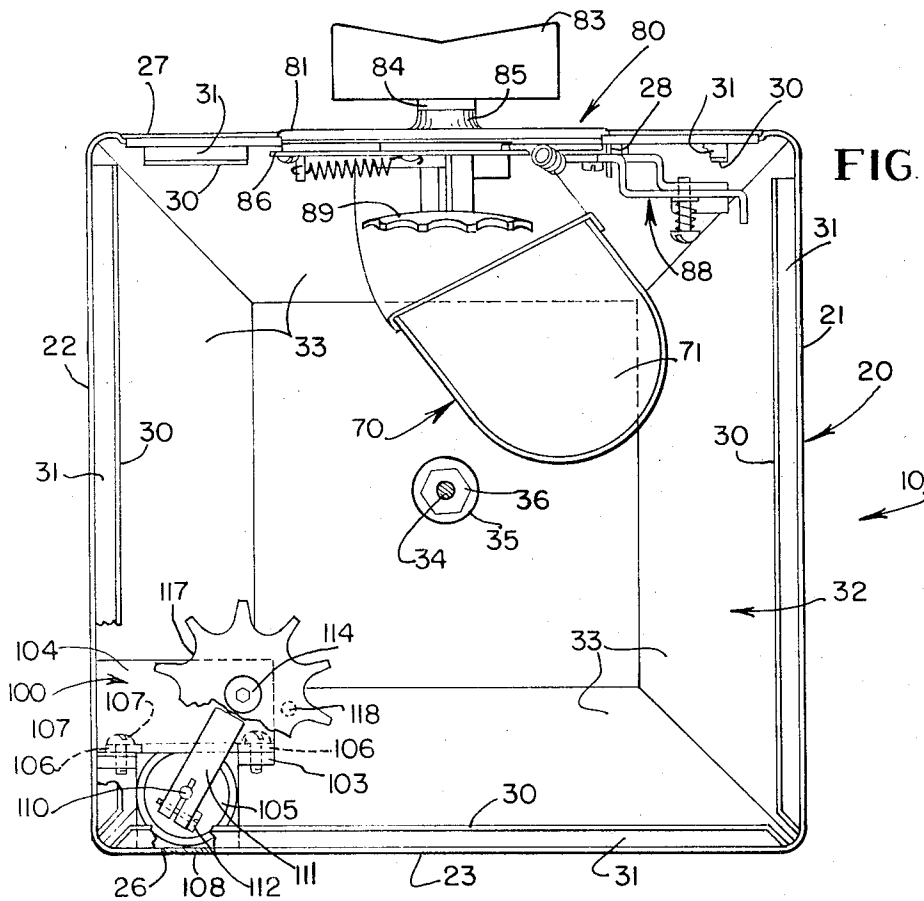


FIG. 2

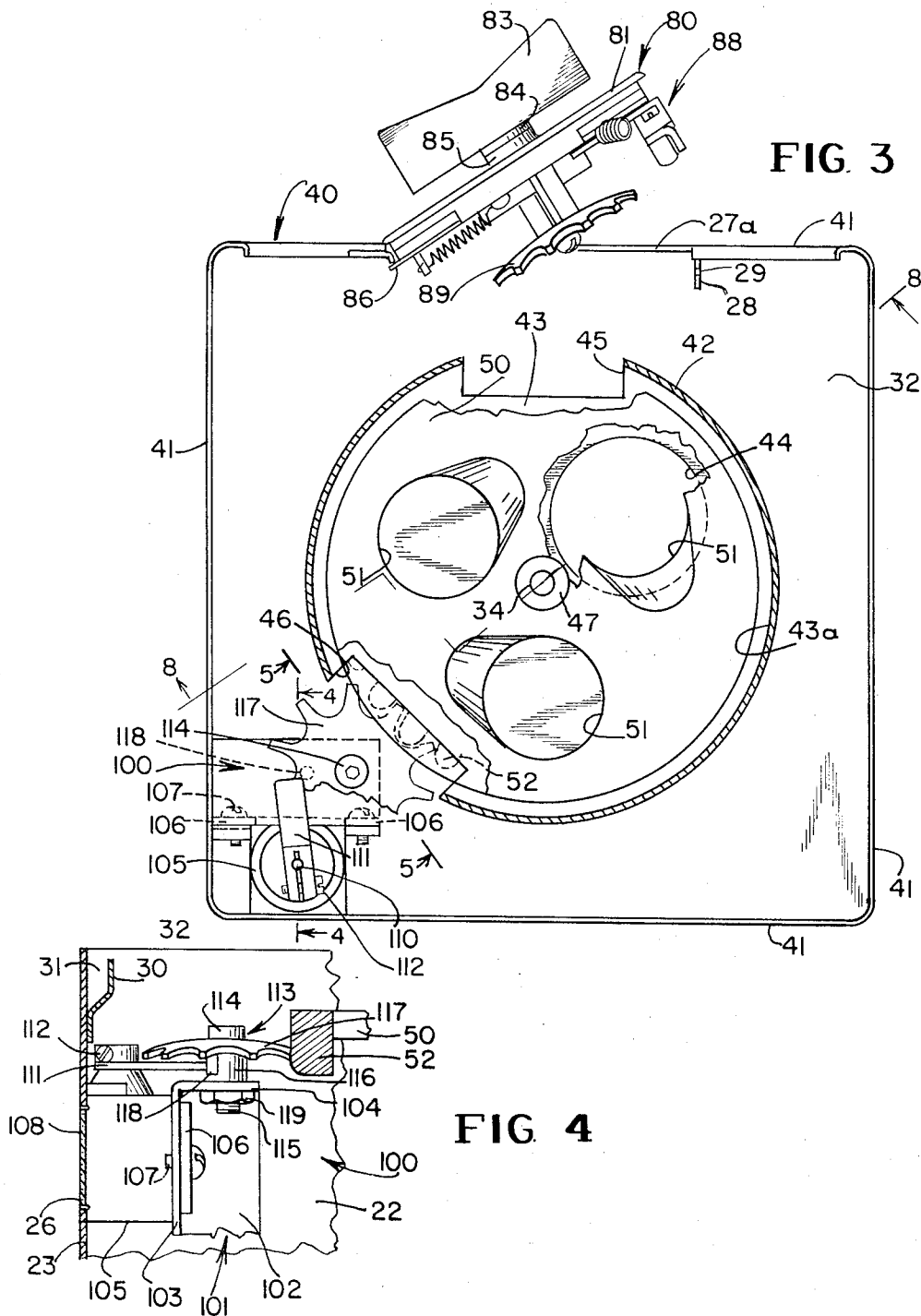


FIG. 5

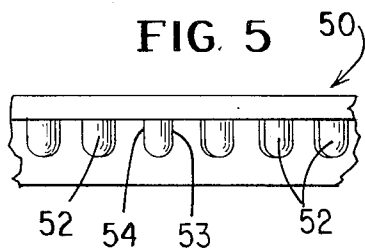


FIG. 6

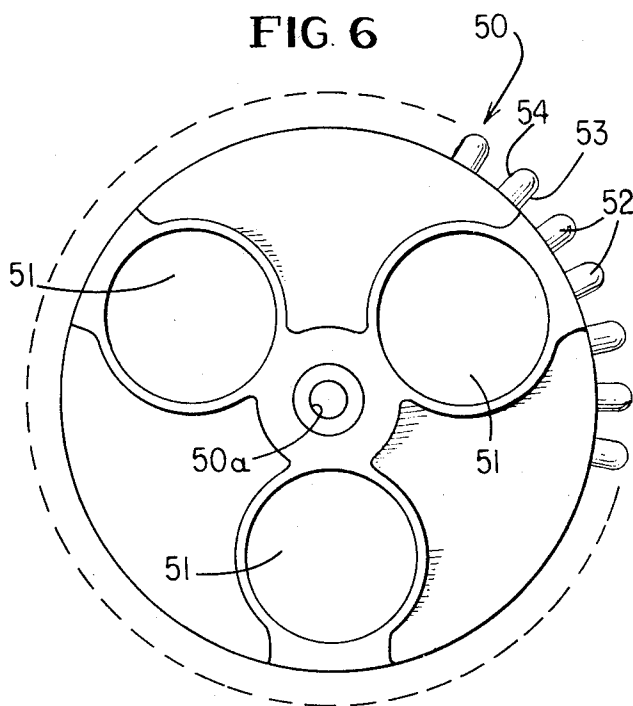


FIG. 7

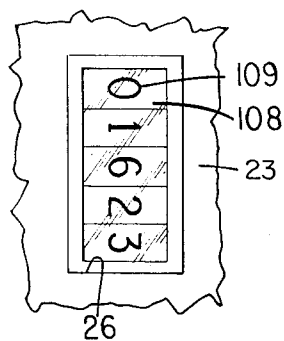
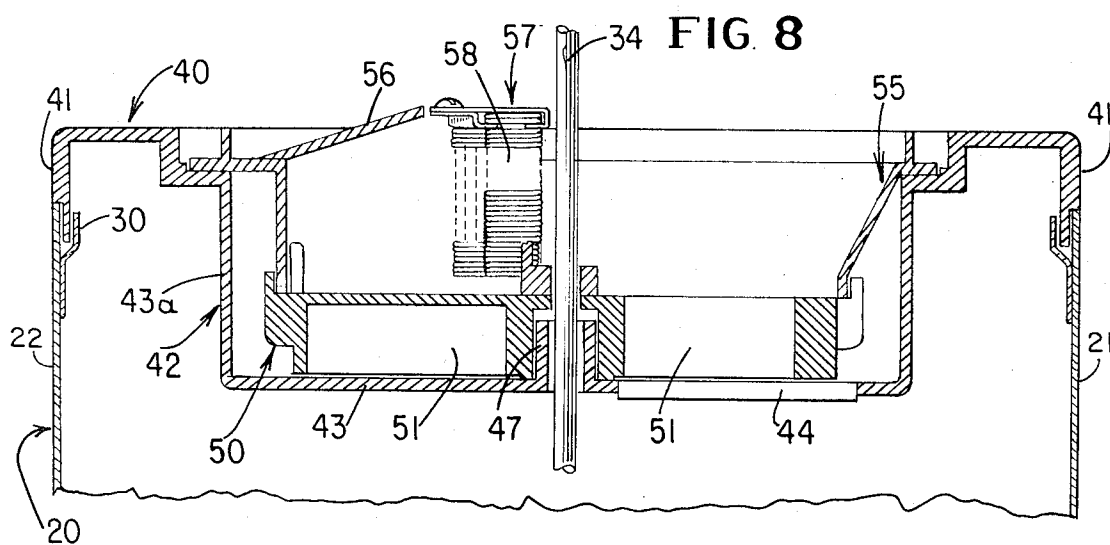


FIG. 8



VENDING MACHINE WITH COUNTING MECHANISM

BACKGROUND OF THE INVENTION

This invention relates generally to vending machines, but particularly to a coin-controlled machine for vending articles of bulk merchandise such as candy, gum balls, nuts, encapsulated items and the like.

Most bulk vending machines in use today have no means by which the amount of money deposited is counted during day-to-day operation. Instead, periodically the machine must be opened, and the money in the cash box thereof removed and counted. The serviceman who counts the money and collects it thus has an opportunity to report only a portion of the total collections and keep the remainder for himself. Without a metering device, there would be no way by which to check to determine whether all proceeds of a given machine have been reported.

While there have been some vending machines available which meter and count deposited coins on a day-to-day basis, these machines have not been entirely satisfactory, basically because the meter can be read only by disassembling the vending machine to gain access to the interior thereof. Of course, the cash box then becomes accessible for misappropriation of receipts by dishonest collection men. Although such an internal meter would disclose a discrepancy between money actually deposited into the vending machine and the money which was being reported, the dishonest collection man could falsify the records to that machine indefinitely, until such time as someone else examined the meter. By that time, the dishonest collection man could have drawn off a substantial portion of the gross receipts of the machine.

Because of the difficulties with theft, it has been common practice to have all collection men bonded, a costly procedure. Also, it is not unusual for large operators of bulk vending machines to recall their collection men periodically for lie-detector tests to determine whether they have been misappropriating from the machines for which they are responsible. This also adds to the cost of operating the vending machines.

Another shortcoming of those few vending machines presently on the market incorporating some metering arrangement is that the meter is connected directly to the coin-actuating mechanism. Thus, each time the coin-actuating mechanism is operated to dispense a quantity of merchandise, the meter or counter registers accordingly. However, it has been found that the coin-actuating mechanism is the most likely component of a vending machine to require repair or other servicing. With the counter engaged directly to the coin-actuating mechanism, they must first be disengaged in order to service the coin-actuating mechanism.

SUMMARY OF THE INVENTION

It is therefore an important object of the present invention to provide an improved bulk vending machine which has a counting mechanism that can be examined without gaining access to the interior of the machine.

Another object is to provide a counting mechanism for a bulk vending machine wherein the meter or display is visible from the rear so as to enable placement of two or more such machines in side-by-side relationship.

Still another object is to provide a counting mechanism for a bulk vending machine which is not coupled to the coin-actuating mechanism therefor.

Yet another object is to provide bulk vending machines which are much less susceptible to pilfering of money by those having access to the machines.

A further object is to facilitate servicing of the coin-actuating mechanism of a bulk vending machine incorporating a counting mechanism.

A still further object is to decrease the costs of operating bulk vending machines by lessening the number of men having to be bonded or to take lie-detector tests.

A yet further object is to provide a bulk vending machine, the keys to which may be given only to a certain man who would have to be bonded, but who can service a great number of machines since no counting is required, and enable other unbonded employees to periodically examine and record the gross receipts as of that time without gaining access to the interior of the machine.

Another object is to provide a counting mechanism which is irreversible so as to preclude a dishonest collection man from appropriating to his own use a portion of the receipts without indicating such appropriation.

Still another object is to provide a vending machine which can readily and inexpensively be modified to accommodate a counting mechanism.

In summary, there is provided a vending machine comprising a hollow base having a wall with an opening therein, a merchandise container supported by the base and releasably secured thereto, coin-actuated dispensing means operative when a coin is deposited therein to cause merchandise to be dispensed from the container, and a counting mechanism mounted in the base and including a numerical display device and operating means therefor, the operating means being coupled to the coin-actuated dispensing means and responsive to operation thereof to cause a corresponding change in the number displayed by the display device, the display device being mounted in the base so as to be visible through the opening therein to enable examination of the displayed number without gaining access to the interior of the base.

In a preferred form of the invention, the coin-actuated dispensing means includes a dispensing unit and a coin-actuating mechanism, the operating means being coupled to the dispensing unit to enable the coin-actuating mechanism to be removed for servicing without affecting the intercoupling between the operating means and the dispensing unit.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangements, and a combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a pair of side-by-side bulk vending machines each incorporating a counting mechanism according to the features of the present invention;

3

FIG. 2 is a view in horizontal section on an enlarged scale of the vending machine, taken along the line 2—2 of FIG. 1;

FIG. 3 is also a view in horizontal section of the vending machine, but taken along the line 3—3 of FIG. 1, and with the coin-actuating mechanism tilted outwardly preparatory to removal thereof;

FIG. 4 is a view in vertical cross section, on an enlarged scale, taken along the line 4—4 of FIG. 3;

FIG. 5 is a fragmentary elevation view on an enlarged scale taken along the line 5—5 of FIG. 3, showing the merchandise wheel in elevation;

FIG. 6 is a bottom plan view of the merchandise wheel;

FIG. 7 is a fragmentary elevational view of the window and digits forming part of the counting mechanism depicted in FIG. 4; and

FIG. 8 is a view in vertical section, taken along the line 8—8 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to the drawings, there is shown a vending machine 10 preferably of a type capable of dispensing bulk merchandise such as candy, gum balls, and the like. The vending machine 10 includes a rectangular base 20 defined by side walls 21 and 22 joined at the rear ends thereof by a rear wall 23 having in the upper left-hand corner thereof (when viewed from the rear) a rectangular opening 26. At the front edges of the side walls 21 and 22 is a front wall 27, the whole central portion of which is open at 27a. Adjacent to the opening along one side thereof is a rearwardly-directed finger defining a keeper 28 having a slot 29 therein. There is provided a set of flanges 30 secured to the walls 21, 22, 23 and 27 of the base 20, along the upper edges so as to define channels 31 extending around most of the upper portion of the base 20.

The base 20 also includes a bottom wall 32, the marginal portions 33 of which are inclined slightly upwardly and outwardly. Money deposited into the vending machine 10 will drop down onto the bottom wall 32 where it will be stored until it is collected. An upstanding rod 34 has its lower end threaded into a boss 35 on the bottom wall 32, a lock nut 36 being provided to secure the rod 34 in place. The upper end of the rod 34 is also threaded.

The vending machine 10 also comprises a container mount 40 which has a square outline defined by four side walls 41. There is provided a chute 42 including an annular side wall 43a and a bottom wall 43, which bottom wall has therein an annular orifice 44. The bottom wall 43 and the adjacent portion of the annular side wall 43a is cut out at 45. Another portion of the bottom wall 43 and the adjacent portion of the side wall 43a is cut out at 46. In one form of the invention, the cut outs 45 and 46 were angularly separated by about 135°. Disposed centrally in the bottom wall 43 is an upstanding boss 47 having an opening therethrough for receiving the rod 34. Positioned within the chute 42 and resting on the bottom wall 43 thereof is a merchandise wheel 50 having a central opening for receiving the boss 47 on the container mount 40. The merchandise wheel 50 includes a set of three holes 51 equiangularly spaced therearound. Each hole 51 has a diameter less than the diameter of the orifice 44 of the container mount 40. There is provided a set of teeth 52 located

4

around the periphery of the wheel 50, each tooth 52 having a pair of substantially-vertically-arranged engagement surfaces 53 and 54. When positioned on the bottom wall 43 of the container mount 40, the merchandise wheel 50 is free to rotate about a substantial vertical axis. When one of the holes 51 is aligned with the orifice 44, whatever merchandise is contained in the hole 51 will drop through the orifice 44. Also positioned within the chute 42 is a member 55 having a top wall 56 covering one half of the member 55. A curtain 57, defined by a set of vertical springs 58, is arranged vertically between the top wall 56 and engages the upper surface of the merchandise wheel 50. The member 55 is so arranged that the orifice 44 in the container mount 40 is vertically aligned with the center of the top wall 56. The member 55 prevents merchandise from passing directly through the merchandise wheel 50 in the chute 42, but, instead, requires the wheel 50 to rotate until one hole 51 is in registration with the orifice 44.

Secured to the container mount 40 is a transparent container 60 which is slightly trapezoidal in vertical cross section, with the distance between the side walls being slightly less at the bottom than at the top.

A lid 61 fits onto the top of the container 60, a lock 62 being provided which has a threaded interior and is rotatable onto the upper end of the upstanding rod 34 when a key 63 is inserted. Insertion of the key into the lock 62 enables rotation of the lock 62 to disengage it from the rod 34, whereupon the lid 61 may be removed. To gain access to the interior of the base 20 where the cash is located, the container 60 and the container mount 40 therefor are removed as a unit.

Mounted in the base 20 is a chute 70 having its inlet 71 communicating with the orifice 44 on the container mount 40. The outlet of the chute 70 terminates in a flap 72 which is hingedly mounted adjacent its upper end. Thus, merchandise which drops through a hole 51 in the merchandise wheel 50 and through the orifice 44 of the container mount 40 will pass through the chute 70 and rest against the flap 72. The merchandise may then be removed simply by opening the flap 72, to enable the merchandise to fall out.

The vending machine 10 also comprises a coin-actuated mechanism 80 including a front plate 81 having adjacent its top a coin-receiving recess 82. A handle 83 is carried by a shaft 84, which shaft passes through an outwardly-directed boss 85 so as pivotally to mount the handle 83. The mechanism 80 also includes a rear plate 86 which is spaced from the front plate 81. There is provided a space between the plates 81 and 86 adjacent the right-hand side thereof as viewed in FIG. 1, which space receives therein the adjacent edge of the front wall 27 that defines the opening 27a. The mechanism 80 may then be pivoted rearwardly until it reaches the position shown in FIG. 2, whereupon a latch 88 may be moved to its locking condition by engaging the keeper 28. Further details of the coin-actuated mechanism 80 are not believed necessary to understanding the instant invention. Any suitable such mechanism is appropriate so long as the handle 83 will rotate only upon insertion of a coin into the coin-receiving recess 82. The mechanism may include other features such as a slug-rejector portion.

Mounted on the inner end of the shaft 84 is a gear 89, which gear 89 meshes with the merchandise wheel 50 through the cutout 45. The shaft 84 is rotatable only in

the clockwise direction, whereby the teeth of the gear 89 will engage the engagement surfaces 54 of the teeth 52. It should be noted that the merchandise wheel 50 and the gear 89 are so constructed that the teeth of the two will intermesh, despite the fact that the axes of rotation of the two gears are normal to each other. Money deposited in the recess 82 passes through the coin-actuating mechanism 80, during which time it is examined for proper denomination and whether or not it is a slug. If the coin is in order, it will enable clockwise rotation of the handle 83 to permit merchandise in one of the holes 51 to pass through the orifice 44 and down the chute 70.

The vending machine 10 finally comprises a counting mechanism 100, which counting mechanism includes a bracket 101 having three flanges 102, 103, and 104, all arranged perpendicular to one another. The flange 102 is secured to the rear portion of the side wall 22 as by welding, so that the flange 103 is disposed generally parallel to the rear wall 23 and spaced forwardly therefrom. Also, the flange 104 will be arranged horizontally. A counter 105 has a pair of outwardly-directed flanges 106 secured to the flange 103, and fits within the space between the flange 103 and the rear wall 23. The counter 105 has a transparent plate 108 which protrudes into the opening 26 in the rear wall 23 in such a manner that the outer face of the transparent plate 108 is flush with the outer surface of the rear wall 23. The digits 109 displayed by the counter 105 can be viewed through the transparent plate 108. The counter 105 includes a shaft 110 extending generally upwardly and carrying a laterally-directed, plate-like lever 111 secured to the shaft 110 by a set screw 112. There is also provided a shoulder screw 113, having an enlarged head 114 and a threaded opposite end 115. The portion between the head 114 and the threaded end 115 is unthreaded and rotatably receives a bushing 116. A gear 117 is supported by the bushing 116 and includes a depending pin 118, which gear 117 is secured to the screw 113 by a nut 119. The teeth on the gear 117 engage the teeth 52 on the merchandise wheel 50 through the cutout 46.

As the gear 117 rotates, the pin 118 thereon engages a side of the lever 111 to swing or pivot the same about an axis defined by the shaft 110. Movement of the lever 111 causes the counter 105 to register and change the number represented by the digits 109. Each revolution of the gear 117 will increase the number represented by the digits 109 by one. Thus, each time the handle 83 is rotated an entire revolution, to rotate the gear 89, the merchandise wheel 50 will rotate to dispense the merchandise contained therein, which rotation of the merchandise wheel will cause a revolution of the gear 117 and cause such revolution to register in the counter 105.

It is preferable that the number of teeth in the gears 89 and 117 are the same, so that one revolution of the handle 83 will cause an entire revolution of the gear 117. Also, by using the same gear, the expense of an additional part by virtue of the addition of the counting mechanism 100 is reduced, since that particular gear is already stocked. It should be noted that the teeth of the gear 117 engages the surfaces 53 of the teeth 52, which are the surfaces opposite to those engaged by the gear 89. Also, the axis of the gear 117 is parallel to the axis of rotation of the merchandise wheel 50. Thus, the wheel 50 is so constructed as to enable engagement by

the gears 89 and 117 which have their axes arranged normal to each other.

It is also noteworthy that the counter 105 is visible from the rear of the vending machine 10, so as not to affect adversely the appearance of the machine 10 when viewed from the front. Also, the fact that the counter 105 is visible from the rear renders it possible for a number of vending machines 10 to be arranged in side-by-side relationship without obstructing the view of the counters. Also, the counter 105 may be examined without having to gain access to the interior of the vending machine 10. Thus, one who periodically notes the reading on the counter 105 and examines it can do so from the outside and need not have a key by which to gain access to the vending machine 10 and the money contained therein.

The counting mechanism 100 does not interfere at all with the coin-actuated mechanism 80. During the course of operation of the vending machine 10, it has been found that the coin-actuated mechanism 80 often requires servicing either to repair it or to remove a slug which has not been discharged. The coin-actuated mechanism 80 may be removed by simply unlatching the latch 88 and pivoting the same outwardly as shown in FIG. 3. The counting mechanism 100 is not engaged directly to said coin-actuated mechanism 80 and therefore need not be disengaged. Thus, the advantage in operatively coupling the coin actuating mechanism 80 and the counting mechanism 100 individually to the merchandise wheel 50 should be apparent.

The counting mechanism 100 can easily be installed on existing vending machines, by merely mounting the mechanism as shown and forming the cutout 46 in the chute 42.

In one form of the invention, the gears 89 and 117 were identical, each having 10 teeth, except that the gear 117 had a depending pin 118. The merchandise wheel 50 had thirty teeth 52, so that one rotation of the handle 83, caused the merchandise wheel 50 to traverse one-third of a revolution and the gear 117 to traverse one entire revolution.

It is believed that the invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further description, and it should also be understood that, while the preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are, nevertheless, capable of wide variation within the purview of the invention, as defined in the appended claims.

What is claimed is:

1. A vending machine comprising a hollow base, a merchandise container supported by said base and releasably secured thereto, a dispensing wheel mounted for rotation beneath said container and rotatable to merchandise dispensing positions, said dispensing wheel having a plurality of teeth around the periphery thereof, a coin actuated mechanism including a plate and a handle rotatably carried thereby and a first gear operatively attached to said handle and a means on said plate for precluding rotation of said handle except upon receipt of a predetermined coin, means for removably mounting said coin actuating mechanism on said base with said first gear engaging the teeth of said dispensing wheel, said rotation-precluding means being operative upon receipt of a coin to enable said handle to be rotated to rotate said dispensing wheel to a mer-

7

chandise dispensing position thereof, and a counting mechanism mounted in said base and including a numerical display device and a second gear therefor, said second gear engaging the teeth of said dispensing wheel and responsive to rotation thereof to cause a corresponding change in the number displayed by said display device, said coin actuating mechanism and said counting mechanism being entirely independent from each other and independently engaging said dispensing wheel, whereby said coin actuating mechanism can be removed for servicing thereof without affecting the engagement of said counting mechanism with said dispensing wheel.

2. The vending machine set forth in claim 1, wherein said first and second gears have substantially the same diameter.

3. The vending machine set forth in claim 1, wherein the diameter of said dispensing wheel is substantially

8

greater than the diameter of each of said gears.

4. The vending machine set forth in claim 1, wherein each of said gears has substantially the same number of teeth.

5. The vending machine set forth in claim 1, wherein the number of teeth on said merchandise wheel substantially exceeds the number of teeth on each of said gears.

6. The vending machine set forth in claim 1, wherein the rotational axes of said merchandise wheel and one of said gears are normal to each other.

7. The vending machine set forth in claim 1, wherein the rotational axes of said gears are normal to each other.

8. The vending machine set forth in claim 1, wherein the axes of said merchandise wheel and at least one of said gears are parallel to each other.

* * * * *

20

25

30

35

40

45

50

55

60

65