June 21, 1960 J. B. DONNELLY 2,941,643

CAN VENDING MACHINE

Original Filed Feb. 11, 1949 2 Sheets-Sheet 1

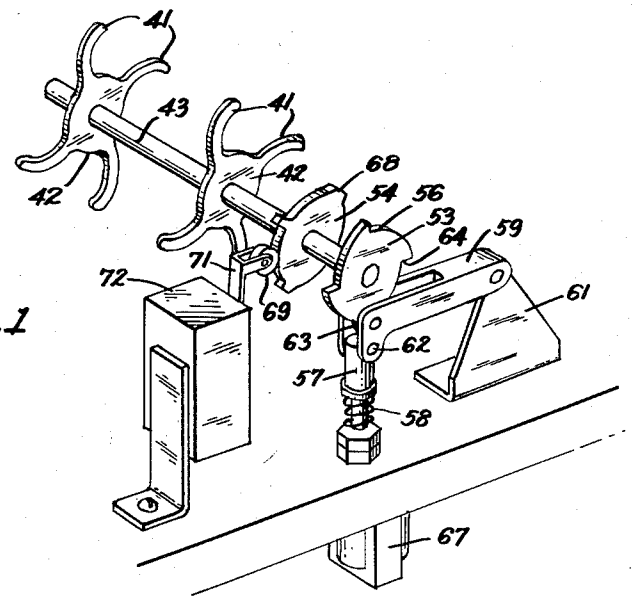


Fig. 1

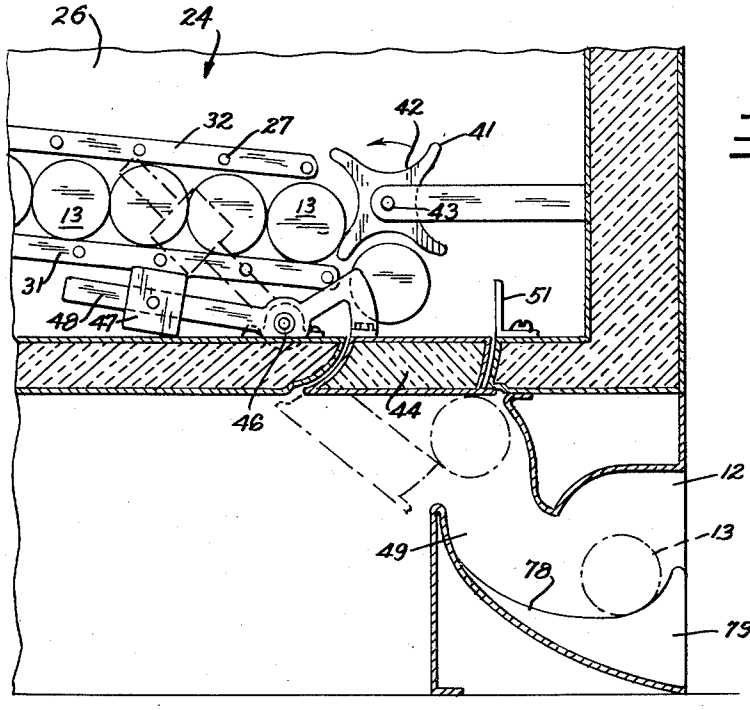


Fig. 2.

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Fig. 3.

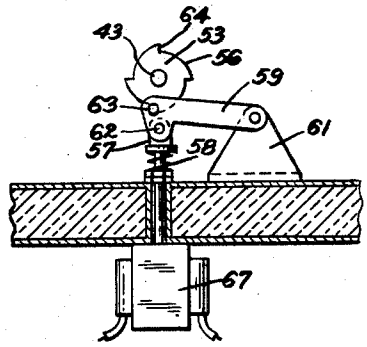
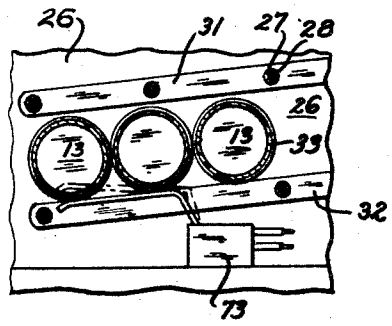


Fig. 4.



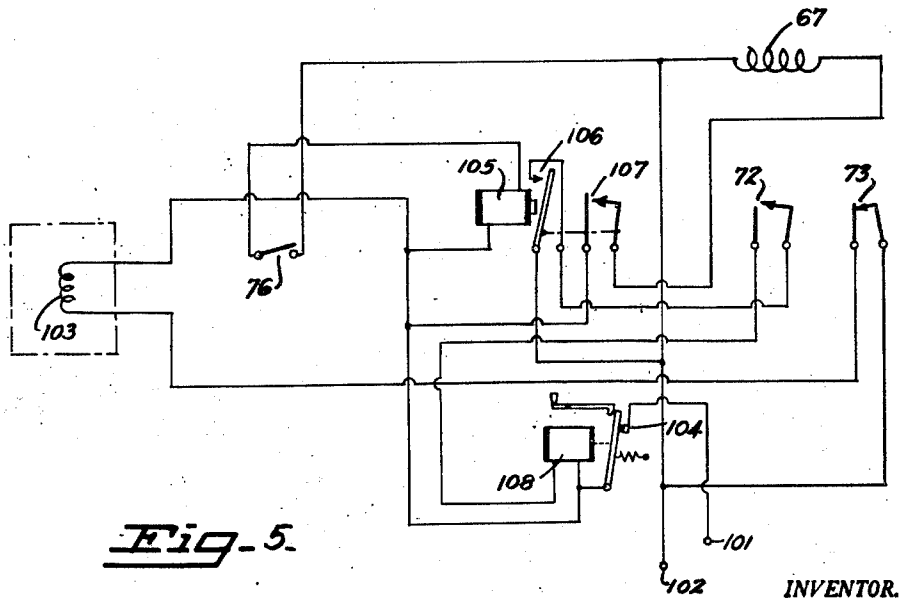


Fig. 5.

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United States Patent Office 2,941,643 Patented June 21, 1960

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CAN VENDING MACHINE

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Original application Feb. 11, 1949, Ser. No. 75,894. Divided and this application Sept. 11, 1952, Ser. No. 309,067

2 Claims. (Cl. 194—10)

This invention relates to new and useful improvements in can vending machines. This application is a division of my application Serial No. 75,894, filed February 11, 1949, for Can Vending Machine, now abandoned.

It is a principal object of this invention to provide a coin-actuated vending machine for dispensing beverages in containers.

Another object of the invention is the provision of means associated with each container vending chute to insure discharge of a single container upon deposit of a suitable coin or coins and to prevent the discharge of a plurality of containers in the event that the coin actuating mechanism should jam or get out of order.

Further objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

Fig. 1 is a perspective of the dispensing stars and associated mechanism of a can vending machine.

Fig. 2 is an enlarged sectional view of the lower end of the can trackway and the dispensing station.

Fig. 3 is a section showing the can dispensing cam and mechanism for releasing said cam for rotation.

Fig. 4 is a section showing the empty can switch.

Fig. 5 is a wiring diagram.

The vending machine which is the subject of the present invention is intended for use in automatically dispensing containers such as cans of beer, upon deposit of a coin in the machine.

The machine illustrated in the accompanying drawings has a plurality of separate can dispensing stations 12. It will be understood that a single station machine could be used or the number of different stations multiplied as desired. With each station is associated a shute 24 through which the cans 13 travel by gravity from the point of deposit to the dispensing station 12. The cans are guided through the machine so that their axes are horizontal and the cans roll down trackways affixed to the sides of the chutes. An attendant fills each of the chutes of the machine with a suitable brand of beverage, and the capacity of the machine is such that refilling is required only at infrequent intervals, and meanwhile the machine requires no attention since the deposit of a coin in the coin slot (not shown) automatically sets in motion mechanism hereinunder described to vend a can, which can has been chilled to proper temperature.

Each can chute 24 has a pair of vertical, parallel plates 26 secured so that the distance between the plates is about 1/16 in. greater than the height of the can. Hence, as the cans move down through the machine, there is sufficient clearance between the can and the plates to prevent binding or jamming of the can within the machine.

On opposed faces of the side plates 26 are fixed circuitous tracks 31 and 32, said tracks being arranged to support the beads 33 at each end of the can 13 to permit the cans to roll down the tracks under the attraction of gravity. The surfaces of the tracks upon which the cans rest are perpendicular to the plates 26 and thus the ends of the cans move freely parallel to the plates. The width of the tracks is only about 1/4 in. and hence the tracks do not interfere with free circulation of air between the plates. The working surfaces of the tracks on each of the opposed plates are directly opposite each other so that the axes of the cans are horizontal.

As each can reaches the bottom of its chute, it is dispensed, and the remaining cans in the chute roll down one position until they reach the end of the last track. When the preceding can is dispensed the next can is engaged by one of the fingers 41 of each of the stars 42 which are curved in such manner that when the stars revolve through a quarter revolution upon revolution of the shaft 43 on which the stars are mounted, as hereinafter described, a single can is engaged by the fingers 41. Each curved finger 41 upon a quarter rotation of the shaft 43 is interposed between the can being dispensed and the next succeeding can, and the fingers prevent cans from passing the bottom station of each inclined chute except when the shaft 43 rotates. It is preferable that there be two or more stars 42 on each shaft engaging each can, the better to hold the can in position.

As will be hereinafter described, suitable mechanism is provided to prevent cans from rotating the stars in the event that no coin is deposited or a bogus coin is deposited. However, deposit of a coin in the slot unlatches the shaft 43 and permits the force of gravity to cause the can at the last station of the chute to rotate the stars 42, and this will permit the can to fall down onto the hinged trap door 44 which is pivoted at axis 46 and suitably counterweighted by the weight 47 adjustable on lever 48 so that the weight of the can will cause the trap door to swing back and allow the can to pass into the dispensing chute which is of a generally goose neck shape. Counterweighting of the trap door 44 deters a dishonest patron from reaching up through the dispensing section 12 and pulling a can out of the machine and also holds the door closed except when a can is being dispensed. The trap door 44 may be insulated to prevent escape of cold air and hence conserve refrigerating medium. A guide 51 is disposed beyond the leading edge of the trap door to direct the can to the dispensing chute 49. Dispensing station 12 located at the front of the machine communicates with chute 49 so that the purchaser may reach into the dispensing station and lift out the can which has been vended.

The shaft 43 on which the stars 42 are mounted also bears two cams 53 and 54 so mounted that the stars may not rotate except upon rotation of both of the cams 53 and 54. The first cam 53 mounted on shaft 43 is for the purpose of permitting the stars 42 to rotate only one-quarter of a revolution for each coin deposited in the machine. Accordingly the cam 53 has four equal dwells 56. The bottom of cam 53 is engaged by plunger 57 which is biased upward by spring 58 and which when retracted permits rotation of the cam 53. Since the retraction of the plunger 57 is momentary and the plunger by reason of operation of spring 58 returns to contact with the cam 53, rotation of the shaft 43 in excess of 90° is prevented. The plunger 57 is guided for proper engagement with cam 53 by bifurcated arm 59 pivotally connected to bracket 61 fixedly mounted in the machine. The plunger 57 is straddled by the bifurcated portions of arm 59 and connected to pin 62 borne by the arm 59. A second pin 63 also borne by arm 59 actually engages the cam 53 and the movement of plunger 57 is directly transmitted to pin 63. The shape of the cam 53 surface is such as to present four notches 64 with a gradually

increasing radius from the bottom of one notch to the top of the succeeding notch. Therefore, the pin **63** bearing against the cam **53** and engaging the notch **64** prevents rotation of the cam, and because of the pitch of the cam surface between adjacent notches and the pressure of the spring **58** biasing the plunger **57** against the cam surface, there is a tendency for the cam to be rotated a full 90° so that the pin **63** abuts the notch **64**. Thus, the action of the spring **58** and the inclined surface of the cam tend to cooperate with the force of gravity on the cans to insure discharge of one can for each coin inserted and prevent accepting a coin without furnishing a can. The plunger **57** is caused to retract upon insertion of a coin into the coin slot. Assuming the coin to be genuine its passage through the slug rejector in its path to a coin collecting box (not shown) causes an electrical impulse to actuate the solenoid **67** and retract the plunger **57**. In the event that the coin is bogus, the plunger **57** is not retracted and no can is dispensed.

Also mounted on the shaft **43** which bears the stars **42** is a second cam **54** the purpose of which is to prevent multiple discharge of cans in the event of a coin jamming in the machine or because of some other defect in operation. There are positioned on the second cam four equally-spaced projections **68** which are angularly positioned about midway between the notches **64**. The projections **68** engage and move away from the shaft a cam-engaging roller **69** which is mounted on a flat spring **71** and designed when moved away from the shaft **43** to actuate a microswitch **72** which opens an electric circuit. Actuation of the microswitch **72** causes the current to be cut off, and thus the solenoid **67** is de-energized and the plunger **57** is protracted by spring **58** to engage the next notch **64** of the cam **53**. When a coin is dropped into the machine, it causes a momentary passage of current through the solenoid **67** as it passes microswitch **76** in its passage from the bogus coin detector into the coin box. Hence the microswitch **76** is turned on and off rapidly, and the solenoid **67** energized only for a very short interval, and the plunger **57** is retracted only a sufficient time to allow pin **63** to clear the notch **64**. If for some reason the microswitch **76** stays on due to a coin jamming or some electrical failure, the microswitch **72** actuated by one of the projections **68** on cam **54** shuts off the current. Therefore, the effect of the two cams **53** and **54** on the shaft **43** is to insure discharge of a single can for each coin inserted in the coin slot.

A system of electrical relays permits microswitch **72** to shut off the current only when current is flowing through the solenoid **67** or, in other words, only when the microswitch **76** is actuated. In normal operation, when there is no jamming of coins in the machine or other electrical failure, due to the fact that the projections **68** on cam **54** are 45° angularly removed from the notches **64** of cam **53**, the microswitch **76** attached to the coin mechanism is no longer in operation and the current passing through the solenoid **67** has been shut off before the microswitch **72** is closed. Hence in such normal operation the current is not shut off.

Provision is also made for return of the coin to the purchaser in the event that the chute is empty. For this purpose a switch **73** is mounted adjacent the end of the last stretch of track **31**, and in the event that the last can before the stars **42** has been dispensed, the switch **73** will move upwardly because no can holds it down and the electrical circuit hereinafter described will be interrupted and the coin returned to the purchaser through a conventional coin return slot (not shown).

As will be seen from Fig. 2, the cans after having been dispensed from the stars **42** fall down through the trap door **44** and into the dispensing chute **49** which is of a generally goose neck shape. Provision is made for inserting the purchaser's hand to grasp the can by cutting away the chute in the mid-section so that either end of the can is suspended on trackways **78** and space between the trackways **79** at the mid-section enables the purchaser to insert his hand under the can and lift it out.

Reference now being had to the wiring diagram, Fig. 5, it will be seen that electric current is introduced into the machine from a power source designated by contact posts **101** and **102** which represent the introduction of the current into the circuits hereinafter described.

If there is a can at the last station of the chute **24** before the stars **42**, the switch **73** is closed by the weight of the can as has been described. In such event a circuit is established from the post **102** through the switch **73**, through the coin return magnet **103** and through the switch **104** and back to contact post **101**. The energizing of magnet **103** prevents the return of a genuine coin to the patron, the exact details of the mechanism accomplishing this result being well known in this art, not constituting a part of the present invention, and therefore not being described herein. In the event that there is no can at the last station of the chute, the switch **73** is open and hence the magnet **103** is not energized and thus any coin deposited by a patron is returned and no can is dispensed.

Assuming the switch **73** is closed, deposit of a coin in the slot causes a momentary closing of the switch **76**, and this permits current to flow from the post **102** through the vending relay **105**, through the switch **104** and back to post **101**. As current passes through the vending relay **105** it closes two switches **106** and **107**, respectively, it being understood that since the switch **76** is actuated only momentarily the switches **106** and **107** are also actuated only momentarily. Closing of the switch **107** permits current to flow from the post **102** through the vending solenoid **67**. Energizing of the solenoid **67** retracts the plunger **57**, as has heretofore been described, and permits rotation of shaft **43** and dispensing of a can. Energizing of relay **105** also closes switch **106** and this permits current to flow from the post **102** up to the microswitch **72**. Said switch is normally open and hence no current flows therethrough. However, in the event that through some defect in the operation of the machine the relay **105** should continue to be energized for a period of time sufficient to allow rotation of the cam **54** to permit projection **68** to contact roller **69** and thus close switch **72** while current is flowing through the circuit established by closing of switch **106**, said current will flow through relay **108** which is arranged upon energization to open switch **104**. Opening of switch **104** breaks the circuit through vending solenoid **67**, as will be seen from tracing the circuits set forth in Fig. 5, and prevents further rotation of cam **53** and hence dispensing of any additional cans from the machines. The switch **104** remains open upon energizing of relay **108** until mechanically reset by an attendant who prior to resetting the switch **104** corrects whatever defect in the mechanism has tended to prolong energizing of the relay **105** beyond a normal time.

Although I have described my invention in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made without departing from the spirit of the invention or scope of the appended claims.

I claim:

1. Dispensing mechanism for a coin-actuated vending machine for containers comprising a star having a plurality of fingers, each of said fingers being arranged to engage a single container, a shaft on which said star is mounted, a cam mounted on said shaft, said cam having a plurality of notches corresponding in number to the number of said fingers, a plunger biased normally to engage one of said notches to prevent rotation of said cam and said star, chute means for containers having an inclined stretch proximate said star whereby said

shaft is turned by passage of containers when said plunger is retracted, a second cam mounted on said shaft; a plurality of projections on said second cam corresponding in number to the number of fingers of said star and spaced angularly between said notches; a vend electric circuit comprising a solenoid (67) connected to said plunger to retract said plunger from said notches to automatically vend containers when said solenoid is energized, a normally open first switch (107) and a normally closed second switch (104) in series with said solenoid, a coin circuit comprising a normally open third switch (76) arranged to be closed upon deposit of a coin, and a vending first relay (105) in parallel with said series solenoid and first switch and in series with said second switch, said first relay when energized closing said first switch; and an antijackpot circuit comprising a normally open fourth switch (106) arranged to be closed by said first relay when said first relay is energized, said fourth switch being held closed by said first relay only during such time as said vend circuit is energized, a normally open fifth switch (72), said fifth switch being positioned to be closed by said projections on said second cam when said plunger is intermediate said notches, and an anti-jackpot second relay (108), said second switch being in series with said anti-jackpot circuit, said second relay when energized opening said second switch, said second switch having means for maintaining said second switch in open position until manual resetting, said circuits being arranged so that closing of said third switch momentarily energizes said first relay to energize said solenoid to retract said plunger, and upon concurrent closing of said fifth switch and energization of said first relay said second relay is energized to break said vend circuit.

2. The mechanism of claim 1 which further comprises a coin return circuit comprising a normally closed sixth switch, means to open said sixth switch when the supply of containers is exhausted, and a coin return magnet, said magnet being normally energized, said circuit being arranged so that when said sixth switch is opened said magnet is de-energized.

References Cited in the file of this patent

UNITED STATES PATENTS

396,297	Schofield	Jan. 15, 1889
471,053	Henry	Mar. 15, 1892
1,981,783	De Bussey	Nov. 20, 1934
1,985,518	Royden	Dec. 25, 1934
2,360,241	Kuhl	Oct. 10, 1944
2,399,105	Donaldson	Apr. 23, 1946
2,443,376	Case	June 15, 1948
2,474,843	Helsing	July 5, 1949
2,616,776	Jones	Nov. 4, 1952
2,619,213	Harris	Nov. 25, 1952