Dec. 17, 1968 J. P. DORSETT ET AL 3,416,639

COIN-ACTUATED VENDING CONTROL APPARATUS

Filed March 30, 1967 2 Sheets-Sheet 1

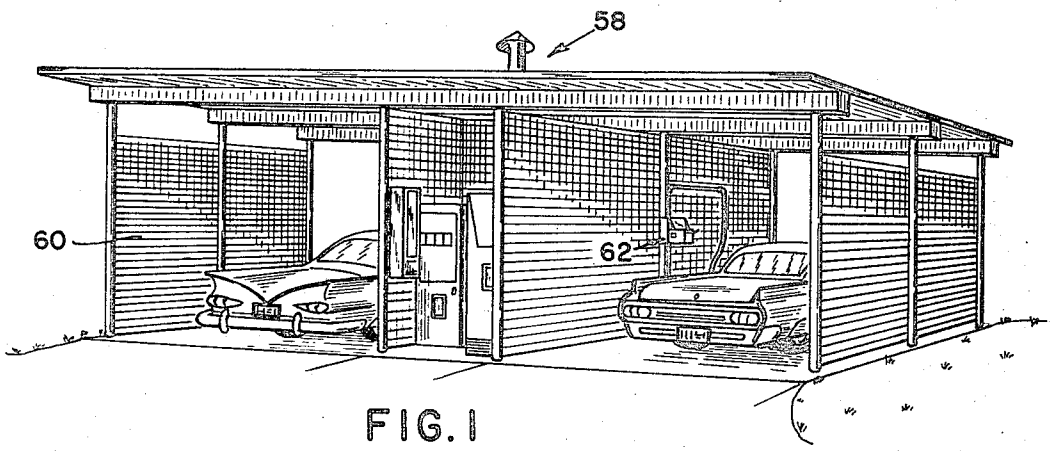


FIG. 1

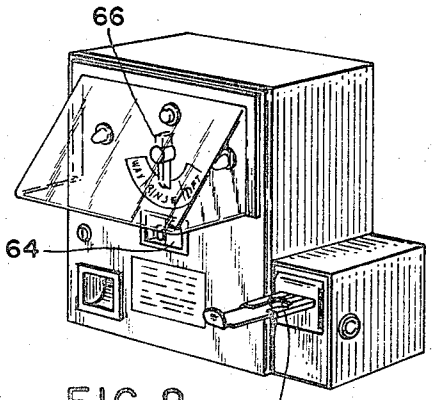


FIG. 2

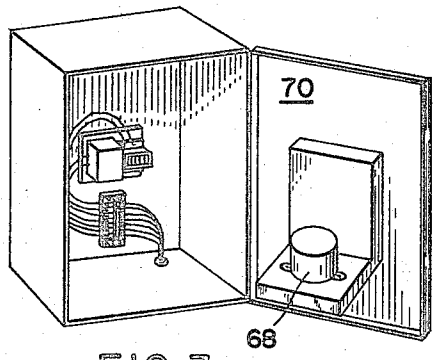


FIG. 3

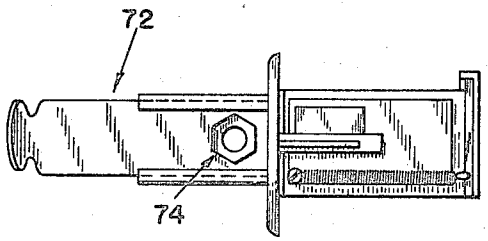


FIG. 4

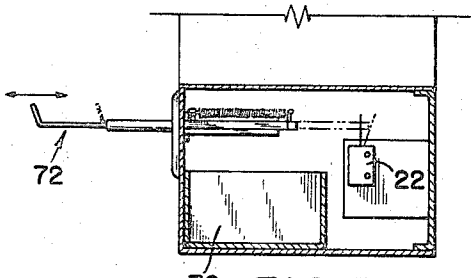


FIG. 5

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COIN-ACTUATED VENDING CONTROL APPARATUS

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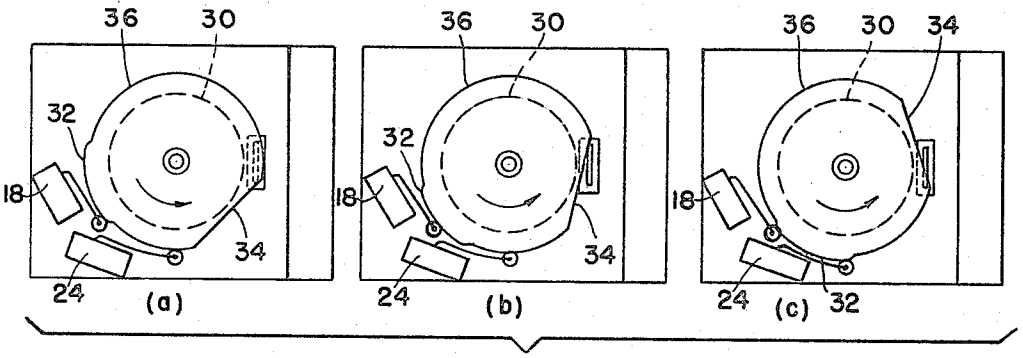


FIG. 6

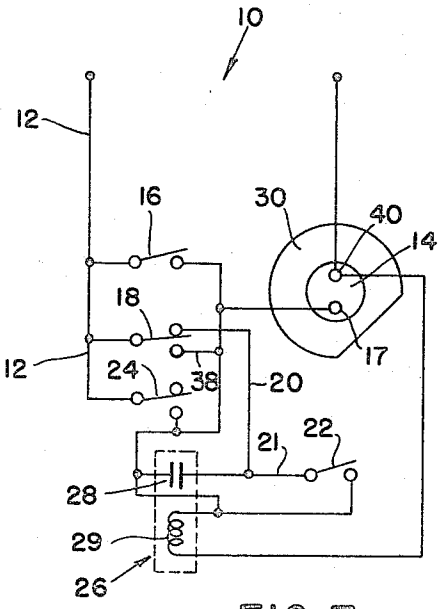


FIG. 7

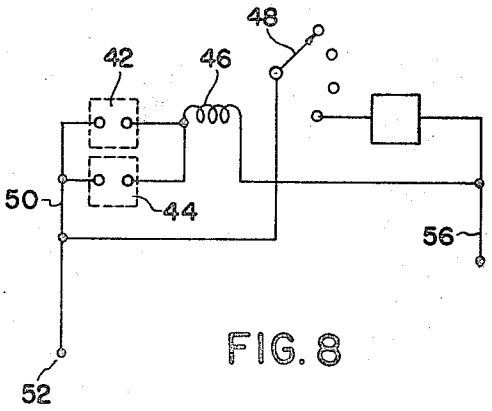


FIG. 8

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COIN-ACTUATED VENDING CONTROL APPARATUS

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8 Claims. (Cl. 194—10)

ABSTRACT OF THE DISCLOSURE

This invention relates to a combination coin-token vending apparatus responsive to the deposit of an assortment of coins, tokens or random combinations thereof and in particular to a vending device for receiving coins and/or tokens to initiate the dispensation of articles or services in response thereto.

Background, brief summary and objects of the invention

Automation has influenced the vending machine business to the extent that unlimited commodities and services may be obtained through coin-operated machines upon deposit of a sufficient amount of coins totaling the purchase price requested to operate the mechanism and dispense the particular article or service desired. In addition to the well-known candy, pastry, sandwich, chewing gum and cigarette vending mechanisms, elaborate coin-operated devices have been developed to serve full-course meals, dispense clothing articles, automotive parts and necessities and similar commodities. Recent innovations include devices for dispensing commodities in containers which include a mechanism for refunding a deposit when the container is re-introduced into the machine such as shown in U.S. Patent No. 3,039,583.

A number of mechanisms are in use which will accept tokens of a specific configuration to actuate the dispensing operation and provide the articles and/or services advertised. Token vending machine discrimination by token configuration is valuable in prevending fraudulent operation of the vending machines and providing records of vending operations made at particular sites or within geographic locations.

Combination coin-token machines have been used for a number of years in transit systems so that the collecting device would accept either coins, tokens or both without the necessity of a manual interchange prior to operation of the vending mechanism, and U.S. Patent No. 2,177,689 discloses a coin and token receiver which is representative of this group.

Recently initiated purchase bonus systems such as the green and gold stamp program whereby the purchasing customer is provided with a number of such stamps commensurate with the total amount of goods purchased have stimulated a great amount of activity in the vending machine are particularly with combination coin-token machines in an effort to utilize such machines in an analogous purchase bonus program. The present invention is a result of exploration of this bonus program wherein a device has been developed which can accept tokens, coins or random combinations of each to provide dispensed articles or services, the tokens distributed to purchasers of particular commodities as a bonus to induce continued sales traffic. While the invention lends itself to any application in articles or service vending through the deposit of coins or tokens, a self-service automatic car wash system is particularly applicable to its use and will be particularly described herein as a representative environment utilizing the preferred embodiment.

Automotive parts suppliers and oil distributors in particular are heavily committed each year to advertising programs for inducing product use, and it is well known that these concerns are free to deposit with service stations and other establishments handling their products china, candies, and other assorted items which are to be handed out upon the purchase of a quantity of gasoline or other automotive necessities as a purchaser incentive to return to that station and continue the use of such products. Service station owners are equally anxious to ensure continued customer patronage and are likely to purchase or at least contribute to the purchase of items which would encourage return of customers for additional products.

The present invention is particularly applicable to such product advertising programs since the tokens used in the combination coin-token vending apparatus could be furnished by the gasoline or oil distributors to the service station for free hand-out to customers who purchase quantities of products along with instructions that the tokens may be used to obtain a free car wash or at least significantly contribute to a free wash depending upon the circumstances of the car wash installation. Oftentimes a service station owner will find it advantageous to have a car wash installation on his premises so that the customer can immediately benefit from the bonus tokens distributed. If the car wash installations are not on or adjacent service station premises, directional posters may be provided at the station for the benefit of token recipients. Use of the bonus token system has been particularly effective for oil companies and service stations in stimulating continued product sales in that there is added inducement to purchase a particular brand and quantity of automotive necessities.

The present combination coin-token vending apparatus comprises a conventional coin-actuated circuit which will energize a control device for initiating the dispensation of services or articles in combination with a token-actuated circuit which can also initiate the dispensing operation either alone or by cooperation with the coin device. The apparatus can be programed to operate on the accumulation of any number of coins, tokens or combinations thereof so that a customer might take advantage of any odd tokens on hand even though that number alone may be insufficient to purchase a complete commodity or service such as a complete wash-rinse-wax cycle from an automatic car wash installation. The token-actuated circuit parallels the coin circuit in furnishing power to a control device for dispensing the services or commodities, and the circuits are so related as to provide interchangeability and free use of one with or without the other.

With the foregoing in mind, it is therefore a primary object of the present invention to provide a combination coin-token vending apparatus responsive to the deposit of coins, tokens or random combinations thereof which can be adaptable to any vending operation whether commodities or services are offered for sale.

Another object of the present invention is to provide a vending apparatus of the type described wherein the vending operation may be either coin-controlled or token-controlled or controlled by interchangeable use of both coins and tokens.

A further object of the present invention is to provide a vending apparatus of the type described which is particularly adaptable to the bonus system of purchasing in that tokens for use with the apparatus may be distributed as a bonus for purchasing products in specific quantities which token may in turn be used to obtain free products or services through the apparatus described.

Another object of the present invention is to provide a coin-token vending apparatus of the type described which is well adapted for use with self-service automatic car washing installations.

Yet still another object of the present invention is to provide a coin-token vending apparatus of the type described which is extremely simple in construction, operation and maintenance and can be adapted to existing coin-operated facilities with a minimum of expense.

Yet still a further object of the present invention is to provide a coin-token vending apparatus of the type described in which the circuit control is accomplished by use of a uniquely designed cam programed to activate and de-activate selective circuits to actuate a dispensing control device.

Yet still another object of the present invention is to provide a coin-token vending apparatus of the type described which is equally adaptable for use with a self-service vending operation such as a self-service car wash wherein each operation of the wash (wash, rinse, wax) is separately actuated by a coin or token and for use with automatic car wash systems whereby a combination of coins or tokens will initiate the automatic cycle which continues through the wash, rinse and wax operations without interruption and without further actuation by the user.

These and other features of the invention will be readily understood and apparent from the following detailed description taken in conjunction with the accompanying drawings wherein like characters of reference designate like parts.

Figure description

FIG. 1 is a perspective view of a self-service automatic car wash installation utilizing the present coin-token vending apparatus for dispensing car washing services in response to the deposit of coins and tokens, either individually or in random combinations thereof.

FIG. 2 is a front perspective view of the exterior housing of a combination coin-token vending apparatus particularly adapted for use with self-service car wash units so that an operator can select the desired operation and deposit a coin or token for the commencement of that operation.

FIG. 3 is an interior perspective view of the housing shown in FIG. 1 illustrating the securement to the interior of the housing of the various control circuits of a coin-token vending apparatus adapted for use with self-service car washing installations.

FIG. 4 is a plan view of the token receiving slide particularly adapted to accept tokens of hexagonal shape.

FIG. 5 is a side elevational, sectional and fragmentary view of the token slide and cooperating token box and token circuit switch and the relationship of these components when the slide is extended into the receptacle upon the deposit of a token.

FIG. 6 (a) through (c) is a sequential portrayal of a circuit control cam as it rotates to actuate various circuit control microswitches within the coin-token vending apparatus used with self-service car wash installations herein described.

FIG. 7 is a schematic diagram of the electrical control circuit for a self-service car wash unit utilizing the present combination coin-token vending apparatus adapted to initiate car wash services in response to the deposit of coins, tokens or random combinations thereof.

FIG. 8 is a schematic diagram of the electrical circuit utilizing the combination coin-token vending apparatus of the present invention to initiate a complete car wash within a fully automatic car wash system.

Detailed description of the disclosure

Referring now to the drawings and particularly to FIG. 7, there is shown a schematic diagram of the electrical circuit controlling a combination coin-token vending apparatus which may, in the diagram shown, be operated by a single coin or a single token to establish a continuous circuit through a control device. The electrical circuit will first be described in its operation and then will be environmentally applied to a self-service car wash to illustrate its utility and simplicity. A voltage source **10** is provided, a convenient voltage of **24** volts AC having been found to be most practical, to the voltage side of which is connected a lead **12** serving the source side of switches and components to be herein described. A motor **14** for driving a timer through a cycle of definite duration within which the services or articles are to be dispensed, is energized from the source **10** through lead **12** and switching components to be described. Lead **12** is connected to a coin switch **16** which is maintained in a normally opened position, and that switch is connected in turn to the source terminal **17** of motor **14**. Lead **12** also connects to a two-pole cam switch **18** whose normal position leaves open the circuit from lead **12** to the timer motor **14**. The normal position of cam switch **18** connects that switch with a lead **20** extending down to one terminal **21** of a token switch **22**. Lead **12** is also connected to the source side of a second cam switch **24** which is normally maintained in an open position so as to preclude a current path therethrough. A relay generally shown as **26** is connected to one side of token switch **22** and becomes energized when that token switch is closed, the current path being from lead **12**, through switch **18**, lead **20** and switch **22**. Contacts **28** associated with relay **26** become closed when the coil **29** of that relay is energized and provide a circuit which will be subsequently described.

In operation, when energization of the control device (timer **14** in this instance) is desired, a coin may be deposited into the coin receptacle which will close switch **16** and provide an immediate circuit for current flow from lead **12** through coin switch **16** to the first terminal **17** of motor **14** so that motor **14** becomes energized and the timer cycle is started for whatever service or article is to be dispensed. Energization of motor **14** drives a cam **30** having a peripheral configuration that will actuate selectively contiguously positioned switches to control the dispensing operation.

The cam **30** is best illustrated in the sequential portrayal of FIG. 6 (a) through (c) which shows the elongated operating node **32** and its relationship as the cam rotates with switches **18** and **24**. FIG 6(a) shows the cam and related switch positions at the beginning of the timer cycle just as the coin switch **16** is closed upon the deposit of a coin. As the circuit is established through the coin switch **16** to the motor **14**, the cam commences rotation (see arrow), and switch **18** holds in an open position as shown in FIG. 7 so long as that switch remains atop elongated node **32**.

The coin switch **16** remains closed by reason of its responsiveness to the coin weight held in the receptacle (not shown). So long as the coin is retained within the receptacle, the switch remains closed, and as long as switch **18** rides atop node **32** of cam **30**, switch **18** remains in the position shown in FIG. 8 and thus no circuit through that switch to motor terminal **17** is established. Rotation of cam **30** to a greater extent will allow the deposited coin to fall free of the weight responsive switch because of a removed portion **34** of the cam at which time switch **16** will again open. Just before the coin is displaced from switch **16**, switch **18** rides off the node **32** and back along the conventional periphery **36** of cam **30** where it becomes closed so that a parallel circuit is established with the coin switch circuit to motor **14**, through lead **12**, switch **18** and the lead **38** connecting to terminal **17** of motor **14**. The motor stays energized until the complete revolution of cam **30** and the positioning of switch **18** on the first edge of node **32** as shown in FIG. 6(a).

In the event token operation is desired, insertion of the token momentarily closes token switch **22** and energizes the coil **29** of relay **26**, the circuit path being from lead **12** through switch **18**, lead **20**, switch **22**, through coil **26** and on to the ground terminal **40** of motor **14**. Contacts **28** associated with relay **26** close with the energization of coil **29**, and a holding circuit is established from lead **12** through switch **18**, lead **20**, contacts **28**, relay **26**

and back to motor terminal **40** so that the relay remains energized until the rotation of cam **30** closes cam switch **24** and establishes a circuit from lead **12**, through switch **24**, through relay **26** and on to terminal **40**. The function of cam switch **24** is to keep the coil **29** of relay **26** energized during the movement of switch **18** from the position shown in FIG. 7 to its alternate position since it is unconnected for an instant as it rides off the node **32** of cam **30**. As soon as switch **18** has reached its alternate position, a permanent motor feeding circuit is established from lead **12**, through switch **18**, through lead **38** and on to motor terminal **17**.

Thus the motor **14** is energized by either of two operations, the depositing of a coin in coin switch **16** or, alternatively, the deposit of a token in token switch **22**, either of these operations being effective to energize the motor and keep it energized through the timer cycle. Obviously the coin and/or token switches may be designed to operate only upon the deposit of a specific denomination of coins, number of tokens, or both according to the price structure of the articles or services dispensed.

A control device operated by a combination of coin-taken deposits is best illustrated schematically in FIG. 8 where a coin switch **42** is wired in parallel with a token switch **44**, both switches positioned to energize a ratchet-displacing coil **46** which, when pulsed, displaces a switch **48** through an incremental step, the number of steps for actuation of the dispensing operation being determined by the number of steps programed. A pulse is generated by the completion of the coin or token circuit when a coin or token is introduced through the respective switches **42** and **44**. The representative example shown in FIG. 8 is programed to receive three pulses after which a circuit will be established from the high potential lead **50** of a voltage source **52**, through switch **48**, through the specific control device **54** to be initiated and back to the ground lead **56**. Obviously any number of steps commensurate with any number of pulse requirements can be utilized so as to accommodate any desired price reflected by coin and token denomination and/or combination.

The above described coin-token vending device has been successfully applied in car washing installations such as that generally designated **58** in FIG. 1. A number of closures **52**, accommodating the washing, rinsing and waxing facilities, are controlled by the coin-token vending apparatus which is shown generally in FIG. 1 as **62**. The unit is normally placed within easy reach of the car owner so that coins or tokens may be expeditiously introduced and the washing operation commenced immediately.

A representative console unit for effecting self-service wash, rinse and wax operations is shown in FIG. 2, this console containing circuitry similar to that illustrated in FIG. 7 and described above. A coin receptacle **64** cooperates with a weight sensitive coin switch indicated as **16** in FIG. 7 to initiate the timer cycle for whatever operation is selected by the indicator **66** on the external surface of the unit. The timer is generally set for a period of approximately five minutes for each cycle, and upon completion of one cycle or operation, an additional coin or token is necessary to commence the second revolution of the cam **30** for a subsequent five-minute cycle. A token receptacle **67** cooperates with the pulsing token switch such as described in FIG. 7 and indicated as **22** to initiate the timer cycle by a token if that be desired rather than by a coin. The circuitry described above and illustrated in FIG. 7 is housed within the console as shown in FIG. 3. The timer and cam are contained within a canister **68** supported on the rear wall **70** of the console front surface as indicated.

As mentioned previously, it is oftentimes desirable to use tokens of a particular shape or configuration for a specific site or geographic area in order to keep accurate accounting records and to provide reliable surveys for marketing purposes. A token slide generally indicated **72** is shown in FIG. 4 and is adapted to received a token of hexagonal shape such as designated by the token receptacle **74**, and the movement of the slide **72** once a token (not shown) is inserted in the receiving slot **74**, is merely in a rearward direction as the token switch **22** is momentarily closed to initiate the timer operation explained above with reference to FIG. 7. Retraction of the slide **72** will allow the token to fall free into a token collector **76** for subsequent removal.

The present invention is obviously well suited for a number of varied applications whether for commodities or services and has been found to stimulate sales and services through the token bonus programs described. Free distribution of tokens with the purchase of specific quantities of goods stimulate interest in that particular line of goods and the distributors of those goods and provide numerous opportunities for vending machine application.

Thus in the broadest sense, the present invention forming a coin-token vending apparatus for dispensing articles or services in response to coins and tokens or random combinations thereof is made up of a coin actuated circuit and a token actuated circuit both serviced from a common source potential **10**, these circuits selectively actuating a control device, in this example a timer motor **14**, for initiating dispensing from related vending apparatus upon the deposit of a predetermined amount of coins or tokens or combinations thereof. A number of control devices are available, and one such device includes a pulsing ratchet relay for displacing a switch according to electric pulses generated by the deposit of coins or tokens, the control device then being actuated after a predetermined or preselected number of pulses have been sensed. The coin actuated circuit includes a coin switch circuit through a coin switch **16** energizing a control device as soon as a coin is deposited. A second parallel circuit is established with the coin switch circuit to energize the control device while the coin switch circuit is in being, and a cam **30** moves to de-energize the coin switch circuit after the parallel circuit has been established, that cam also acting to de-energize the control device (motor **14**) upon the completion of the dispensing operation.

The token actuated circuit includes a token switch circuit through a token switch **22** which energizes the control device **14** when at least one token is received, and a parallel circuit is again established to provide continuous energization to the control device after the token circuit has been disconnected.

We claim:

1. A combination coin-token vending apparatus for dispensing articles or services in response to coins and tokens or random combinations thereof comprising: a coin-actuated circuit; a token-actuated circuit; a source potential energizing said token and coin actuated circuits; and control means for initiating dispensing actuable from said circuits upon deposit of a predetermined amount of coins or tokens, said coin-actuated circuit including a coin switch circuit energizing said control means upon deposit of at least one coin, means for establishing a parallel circuit with said coin switch circuit and energizing said control means after the deposit of one or more coins, means for de-energizing said coin switch circuit after the parallel circuit has been established, and means for de-energizing said control means upon completion of dispensing, said parallel circuit establishing means and said de-energizing means including a cam adapted to complete the parallel circuit at a predetermined time after the coin switch circuit has been energized by the deposit of at least one coin and de-energize said control means upon completion of dispensing.

2. A combination coin-token vending control apparatus as claimed in claim **1**, said token and coin actuated

circuits adapted to generate an electrical pulse upon each deposit of coins or tokens.

3. A combination coin-token vending apparatus as claimed in claim 2, said control means including cumulative pulsing means for sensing a pre-determined number of electrical pulses generated by the deposit of coins or tokens and initiating dispensing after the pre-determined number of pulses have been sensed.

4. A combination coin-token vending apparatus as claimed in claim 1, said token actuated circuit including a token switch energizing said control means upon receipt of at least one token, means for actuating said parallel circuit establishing means to energize said control means, and means for de-energizing said control means upon completion of dispensing.

5. A combination coin-token vending control apparatus as claimed in claim 4, said actuating means including a cam control switch for continuing the energization of said control means until said parallel circuit is established.

6. A combination coin-token vending control apparatus as claimed in claim 4, said token actuated circuit

having a token switch closing momentarily in response to receipt of a token deposited.

7. A combination coin-token vending control apparatus as claimed in claim 1, said coin switch circuit having a weight-responsive coin switch closing under the weight of a coin deposited and opening when the weight of the coin is removed therefrom.

8. A combination coin-token vending control apparatus as claimed in claim 7, said control means including a timer for initiating dispensing over a pre-selected period of time.

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