

[54] **CIRCUIT FOR MULTI-COLUMN VENDING MACHINES HAVING COLUMNS ARRANGED FOR CONJOINT OPERATION**

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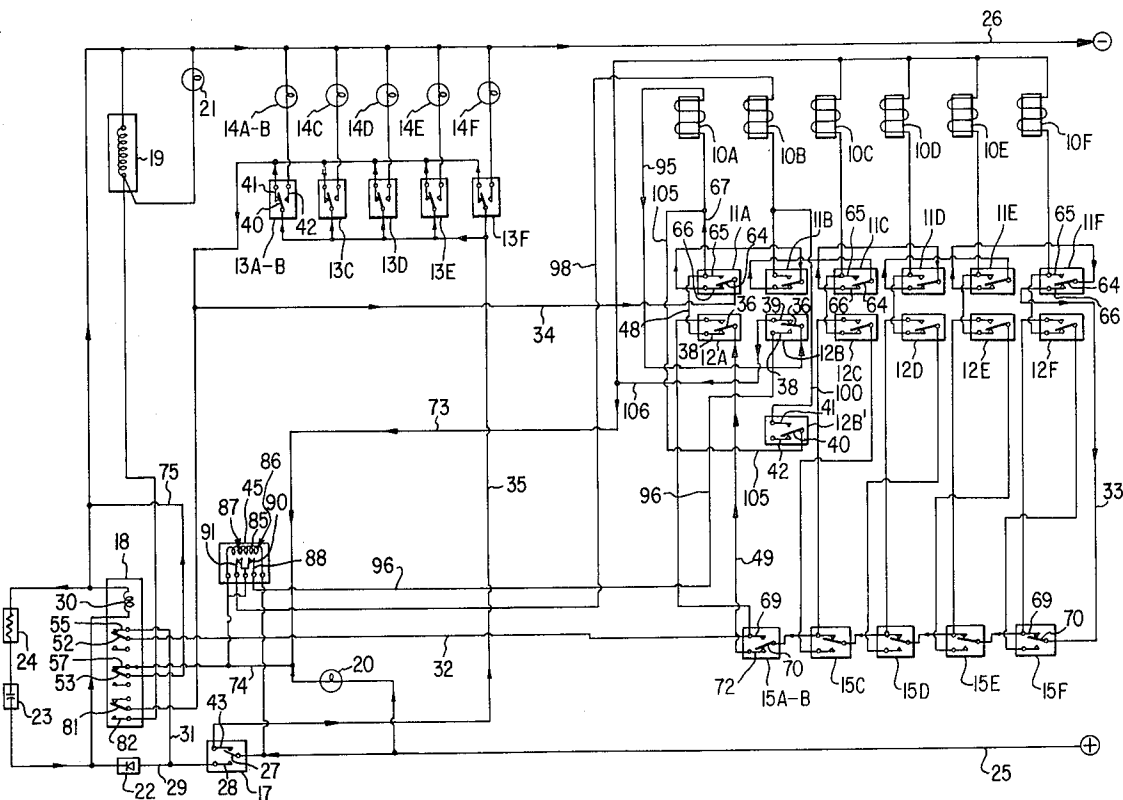
[52] U.S. Cl. **221/67, 194/10**
 [51] Int. Cl. **G07f 11/08**
 [58] Field of Search..... 221/67; 194/10

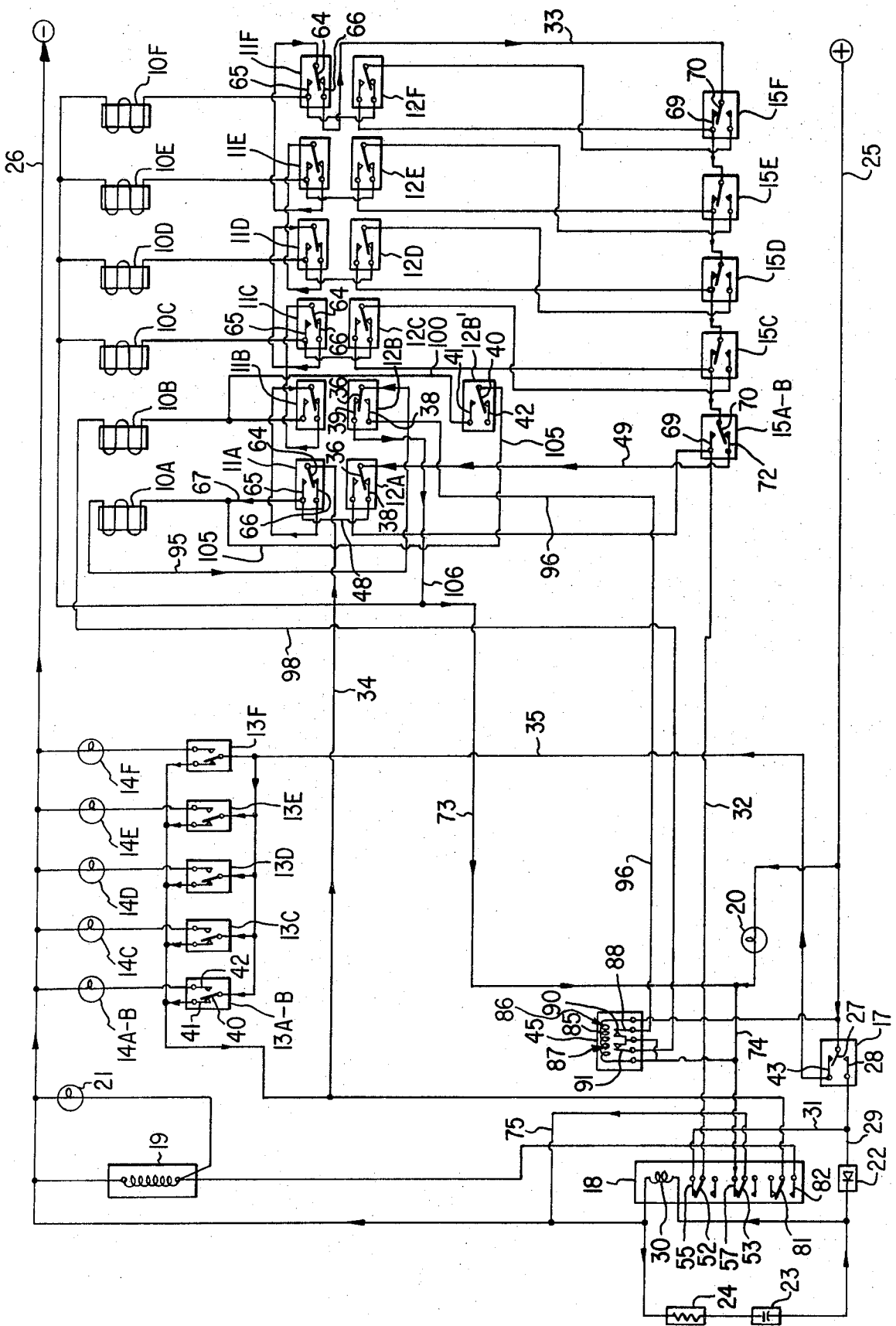
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UNITED STATES PATENTS
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[57] **ABSTRACT**
 A coin operated multi-column vending machine embodies a separate dispensing actuator for each column of product units and associated circuit components including plural customer-operated product selector switches. Two product unit columns are placed under control of an alternator relay and a common selector switch for conjoint operation. Alternate dispensing of products from one of the two product unit columns is effected in response to each actuation of the common selector switch. The invention is particularly applicable to vending machines for dispensing carbonated soft drinks or other food products which are subject to staleness if left too long in the machine and allows for easy modification and conversion of existing multi-column vending machines and their associated control circuits in the field.

14 Claims, 1 Drawing Figure





CIRCUIT FOR MULTI-COLUMN VENDING MACHINES HAVING COLUMNS ARRANGED FOR CONJOINT OPERATION

BACKGROUND OF THE INVENTION

The present invention relates generally to a coin operated vending machine for selectively dispensing articles, one at a time, from a plurality of product storage columns and, more particularly, to a novel control circuit for such a coin operated vending machine that permits alternate dispensing of articles from one of a pair of columns under control of an alternator relay and a selector switch common to the pair of columns.

Coin operated vending machines for selectively dispensing articles, one at a time, from a plurality of stacks or columns are well known. Typical arrangements are exemplified by U.S. Pat. Nos. 2,280,323; 2,549,081; 2,686,583; 2,956,660; 3,348,733 and 3,507,419. Generally, with such arrangements, either a mechanical or an electrical system is provided to prevent delivery of more than one article at a time from a column and prevent "jack-potting" of the machine. The development of an economical system which solves the problem of removing established credit at the proper time and insures delivery of only one article per established credit and which is characterized by minimum requirements of power of operation and minimum interference of elements, thereby allowing a flexibility in construction and operation which reduces cost of operations and maintenance has been a constant challenge to the vending industry.

Electrical operating control circuits have been found to be more desirable than mechanical systems. A typical electrical circuit arrangement is disclosed by U.S. Pat. No. 3,613,854, granted on Oct. 19, 1971 and assigned to the assignee of the present invention. In that circuit arrangement, dispensing from each column is controlled by individual vend solenoids which are controlled by individual selector relays energized through contacts of a vend relay timing circuit which removes established credit from the vending machine at the proper time and insures delivery of only one article per established credit.

The above-described circuit has proved to be very effective but suffers from the disadvantage that after relatively long periods of continued use, particularly at outdoor installations of high humidity, the selector relays are subject to contact deterioration as a result of corrosion and/or oxidation. An improvement of the control circuit disclosed in U.S. Pat. No. 3,613,854 is disclosed in my copending U.S. application Ser. No. 334,251 in which the traditional selector relays are eliminated.

In recent years, the trend in design of coin operated vending machines which handle food products has been to increase the storage capability of the machine, while at the same time provide additional selection choices. Increased storage capability, however, means that products will be retained within the machine for longer periods. This problem is particularly acute in connection with food products or drinks which are subject to staleness or long standing.

As one solution to this problem, it has been proposed to improve stock rotation and minimize time of products within a vending machine by providing an alternately positionable switch that controls alternate ener-

gization of a pair of vend solenoids. In such arrangements, the alternately positionable switch generally is coupled mechanically by suitable linkage means to the dispensing mechanism for actuation to its other position upon dispensing of a product from the storage chute of the machine. In addition to the usual problems associated with mechanical linkage, such arrangements do not readily lend themselves to modification of existing vending machines for alternate product dispensing, in that a difficult field change operation would be required to mechanically couple an alternately positionable switch to the dispensing mechanism in an existing vending machine.

It should be apparent that from the standpoint of the manufacturer of vending equipment the cost of modifications to present equipment must be held to a minimum and it is preferable that field modification or conversion can be readily effected. Utilization of the mechanical structure and the control circuits already in widespread use is desirable and advantageous in some instances, particularly where the cost of retooling for production to manufacture completely new vending machine units is prohibitive.

One popular arrangement which improves stock rotation within a multi-column vending machine and allows field modification of existing machines is disclosed in copending U.S. application 303,360 assigned to the assignee of the present invention. In that arrangement, a product level sensing switch is disposed in one column and connected to switch dispensing control to a second column after a fixed number of product units from the first column have been dispensed. Although this arrangement provides a number of desirable advantages, it still falls short of the desired goal of alternate product dispensing from associated columns which can be used for both new and existing machines.

It is therefore a primary object of the present invention to provide a new and improved control circuit for a coin operated multi-column vending machine with a view to overcoming the above-said disadvantages.

Another object of the present invention is to provide an improved control circuit for a coin operated vending machine that permits a reduction in the storage time of products within the machine.

It is a further object of the present invention to provide an improved control circuit for a coin operated vending machine that effects alternate dispensing of products from a pair of columns under control of an alternator relay and a single selector switch common to the pair of columns.

It is still another object of the present invention to enable modification of existing coin operated multi-column vending machines in a relatively simple and expeditious manner, which modification can be made conveniently and economically in the field.

More particularly, the invention relates to the provisions of an alternator relay which is capable of alternately controlling the grounds of a pair of vend solenoids so as to effect alternate dispensing of products from a corresponding pair of columns in response to each actuation of a single selector switch. The alternator relay is adapted to be switched alternately between a first position and a second position upon de-energization of an operating coil incorporated therein. With the alternator relay kept in its first position, and assuming that credit has been established, actuation of

the single selector switch will energize a first one of the pair of vend solenoids and then remove established credit automatically, whereupon the alternator relay is switched from its first to its second position because of the de-energization of the operating coil. When, in the second position and the single selector switch has again been actuated after credit has again been re-established, a second one of the pair of vend solenoids is energized. In this manner, the stock is most effectively rotated and the possibility of staleness of certain products stored in the two associated columns is minimized by reducing the time during which any of the product units remain stored in the machine prior to selection and subsequent dispensing to customers.

By the present invention, field conversion or modification of existing vending equipment may be readily effected to minimize the aforesaid stock rotation problem. Whether fabricating a completely new unit or modifying an existing unit, it is only necessary to eliminate one customer operated selector switch and a sold out switch from a control circuit of the type shown, for example, in my copending application Ser. No. 334,251, while interconnecting in the control circuit for a pair of associated columns, which are preferably adjacent each other, an alternate relay and one of the removed switches to place the pair of product columns under direct control of a single selector switch. The alternator relay is essentially the only added control element connected in the control circuit and is connected to the ground return line through a set of contacts of a vend relay. The alternator relay is movable alternately between a first position and a second position upon de-energization of its operating coil connected to the vend relay. One position enables energization of the vend solenoid for the first column of the associated pair and the second position enables energization of the vend solenoid for the second column of the associated pair. Thus, alternate dispensing of products from the two columns is effected in response to each actuation of the single selector switch to minimize staleness of the products units.

Other objects and the attendant advantage of the present invention will be apparent from the following description taken in conjunction with the accompanying drawing. Although one specific form of the invention is illustrated, it is to be understood that this drawing is for the purpose of illustration only and is not intended to represent the full scope of the invention defined by the appended claims which particularly point out and distinctly claim the subject matter of the invention.

BREIF DESCRIPTION OF THE DRAWING

The accompanying drawing is a schematic diagram of a control circuit for a coin operated multi-column vending machine embodying the present invention shown in its simplest form. The diagram illustrates the condition with products in column B sold out, credit has been established (vend relay is energized) and a selection in column A made. For convenience, the established power circuits from the hot line to ground return line are indicated by arrowheads.

DETAILED DESCRIPTION

The invention herein may be embodied as a modification to the vending machine control circuits of my copending U.S. Patent application Ser. No. 334,251,

filed February 21, 1973 and assigned to the assignee of the present application. The basic operation of this circuit as to columns C-F remains unchanged, in connection with establishment of credit, vend selection and product selection, the entire subject matter of the above-noted patent application is incorporated herein by reference. As noted in that patent application, the control circuit is illustrated in connection with a vending machine having four columns of product units, while in the present application the control circuit is illustrated in connection with a six column vending machine. The number of columns is dependent on the physical configuration of the machine and the basic mode of operation of the circuit, except for the improvement, remains substantially identical with the operation of the circuit illustrated in the aforementioned patent application. Therefore a complete detailed description of the circuit in this application is unnecessary for a proper understanding of the invention.

It should be noted, however, that the invention is shown in its simplest form in that the alternator relay is shown in connection with two associated columns. The invention is also readily adaptable for controlling a ten column machine, wherein each of two columns are controlled by a separate selector switch using a single alternator relay.

For convenience, the reference characters employed herein to describe the invention in connection with the drawing are made similar to the corresponding reference characters employed in the description of the control circuit in the aforementioned patent application. More particularly, each column of the vending machine has associated therewith a vend solenoid or dispensing actuator 10, a solenoid switch 11, a pair of soldout switches 12 and 13, a soldout indicator light 14 and a selector switch 15. Those components of the circuit in the drawing designated by a numerical character followed by an alphabetical character are disposed for operation with respect to the particular alphabetically designated column of the vending machine to effect dispensing of an article therefrom according to the choice of a customer exactly as described in the aforementioned patent application. However, in the present invention, as will be completely described, one of the selector switches 15 has been eliminated from the circuit, one of the soldout switches 13 has been diverted to another purpose, and an alternator relay 45 has been added and interconnected to the circuit in such a way that the two columns A and B of the machine are electrically connected to function as a single source of supply for like articles under control of the one common selector switch 15A-B, with the articles from columns A and B being dispensed alternately.

In addition to the components associated with a particular column, a number of common control components are provided in the circuit including a coin operated vend switch 17, a vend relay 18, a coin reject electromagnet 19, a select indicator or established credit light 20 and a timing circuit comprising diode 22, capacitor 23 and resistor 24. Power to the circuit is applied across a pair of supply conductors 25 and 26 which may be connected to a conventional supply source (not shown). The positive (+) terminal of power line 25 designates the "hot" line, while the negative (-) terminal of line 26 designates the ground return line.

The operation of the control circuit as described in the aforementioned patent application for removing

established credit by operation of the timing circuit and associated elements remains unchanged in the present invention and therefore need not be described in detail herein but can be readily understood by reference to the noted prior patent.

For convenience, a brief summary of a typical sequence of operation of the vending machine control circuit is set forth as follows. Upon insertion of the proper coinage into the vending machine, coin operated vend switch 17 is momentarily actuated and vend relay 18 is energized. Select indicator light 20 is illuminated to indicate that credit is established. Energization of vend relay 18 establishes a holding circuit for the operating coil 30 through diode 22, lines 29 and 31, a set of contacts 52, 55 of the vend relay, line 32, the series arranged upper set of contacts 69, 70 of select switches 15A-B to 15F, line 33, the series arranged lower set of contacts 64, 66 of solenoid switches 11F-11A, line 34, at least one set of contacts 40, 41 of one or more of the soldout switches 13, line 35 and a set of contacts 43, 27 of vend switch 17 to the supply conductor 25. Also, an enabling circuit for vend solenoids 10C-10F is established through a set of contacts 53, 57 of vend relay 18, and lines 73, 74 and 75, the latter of which is returned to ground return line 26. Energization of vend relay 18 also breaks the energizing circuit for coin reject electromagnet 19 initially maintained through a set of contacts 81, 82 of the vend relay.

The dispensing machine is now ready for a particular selection to be made by a customer, which selection is effected by operation of a selector switch 15. It may be mentioned here that the vending machine may store and dispense a variety of products, such as for example, soft drinks in a variety of flavors. The less popular flavors may be loaded into the columns designated C through F, while the most popular flavor may be loaded into the two columns A and B which are arranged for alternate dispensing of products therefrom in response to each actuation of the one column selector switch 15A-B.

As hereinbefore mentioned, the circuit is shown in its simplest form with only two of the six columns interconnected for conjoint operation. If desired, other pairs of columns could be interconnected in the manner in which columns A and B are interconnected for effecting alternate dispensing of products under control of a simple selector switch and the alternator relay 45.

In order to store like products, columns A and B may be advantageously constructed to provide two adjacent serpentine tracks with one track disposed behind the other and overlapping for maximum utilization of the space within a cabinet, as exemplified in copending U.S. Patent application Ser. No. 303,360, filed Nov. 3, 1972 by James C. Lindsey and assigned to the assignee of the present application. However, in many cases, particularly with older style cabinets, double depth serpentine storage is not available and the articles are stored in laterally spaced serpentine or vertical columns. It will be readily appreciated that the form of the cabinet in which the containers are stored forms no part of the subject invention.

The primary purpose of alternator relay 45 is to alternately ground vend solenoids 10A and 10B so as to cause these solenoids to be alternately energized in response to each actuation of the common selector switch 15A-B. To this end, the alternate relay is of the

double pole, double throw DPDT type and includes an operating coil 85 and two sets of contacts 86 and 87, each having a movable contact arm 88 and 89 and a fixed contact 90 and 91, respectively. The operating coil 85 has one end connected to the supply conductor 25, while the other end is connected to the line 74 so that the operating coil remains energized while the vend relay 18 is energized.

The alternator relay 45 is adapted to be switched alternately between a first position and a second position upon each de-energization of its operating coil 85. In its first position, the alternator relay completes the ground circuit for vend solenoid 10A. The circuit may be traced from the vend solenoid 10A through a line 95, the normally closed contacts 36, 38 of soldout switch 12B, a line 96, a set of contacts 88, 90 of the alternator relay, line 74, a set of contacts 53, 57 of the energized vend relay and line 75 to the ground return line 26. In the second position of alternator relay 45, the vend solenoid 10B is grounded through a line 98, a set of contact 89, 91 of the alternator relay, line 74, a set of vend relay contacts 53, 57 and line 75.

It should be noted that vend solenoid 10B is connected in series with a soldout switch 12B' by means of a line 100. Soldout switches 12B and 12B' may be operated independently of each other or they may be ganged for simultaneous operation. The movable contact arm 40 of soldout switch 12B' is connected by means of a line 105 to conductor 67 which is in turn connected to vend solenoid 10A. Thus, it will be appreciated that vend solenoid 10B is electrically connected to selector switch 15A-B through soldout switches 12B' and 12A. Further, it should be noted that the fixed contact 39 of soldout switch 12B is connected through line 106 to line 73. In this manner, if the B column is empty, solenoid 10A is returned to the ground line 26 directly through contacts 36, 39 of the actuated soldout switch 12B, lines 106, 73 74, contacts 53, 57 of energized vend relay 18 and line 75.

Returning to the general description of operation of the control circuit, first in connection with one of the columns of the machine containing a less popular drink, for example, column C, and assuming that credit has been established and selector switch 15C is actuated by a customer, a circuit is established for initial energization of vend solenoid 10C and then for holding it energized through contacts 64, 65 of solenoid switch 11C, as described in the aforementioned U.S. Patent application Ser. No. 334,251. Energization of vend solenoid 10C opens contacts 64, 66 of solenoid switch 11C to prevent double vending by disabling the initial solenoid energization circuit through select switch 15C. Opening of contacts 64, 66 of solenoid switch 11C also functions to open the holding circuit for the vend relay operating coil 30. At this point, however, the auxiliary power source provided by the timing circuit formed by capacitor 23 and resistor 24 maintains the operating coil 30 energized for a fixed period to enable completion of the selection. Upon discharge of capacitor 23, vend relay 18 is de-energized and contacts 53, 57 open to remove operating power from the vend solenoids. The energization coil of vend solenoid 10C remains energized until the vend relay is de-energized which occurs upon discharge of the capacitor. When vend relay 18 is returned to its normal standby position, the energizing circuit to the holding circuit is broken

and the circuit for coin reject electromagnet 19 is energized.

In a situation where the customer selects the more popular drink contained in storage columns A and B of the machine, the customer will actuate the selector switch 15A-B which automatically controls alternate dispensing from these two columns by operation of the vend solenoid 10A and 10B. For example, assuming that the alternator relay 45 is maintained in its first position by the energization of operating coil 85 which occurs when vend relay 18 is energized, a circuit is established for energization of vend solenoid 10A upon actuation of the selector switch 15A-B. The circuit may be traced from the vend solenoid 10A through lines 67 and 48, the normally closed contacts 38 and 36 of soldout switch 12A, line 49, selector switch 15A-B, the series arranged upper set of contacts 70, 69 of selector switches 15C-15F, line 33, the series arranged lower set of contacts 66, 64 of solenoid switches 11F-11A, line 34, at least one set of contacts 41, 40 of one or more of the soldout switches 13, line 35, and a set of contacts 43, 27 of vend switch 17 to the supply conductor 25. As heretofore noted, the ground side of vend solenoid 10A is connected to ground return line 26 through line 95, the normally closed contacts 36, 38 of soldout switch 12B, line 96, a set of contacts 88, 90 of alternator relay 45, line 74, a set of contacts 57, 53 of vend relay 18, and line 75. Solenoid switch 11A and the related circuit components will now function in exactly the same manner described immediately above in connection with column C for dispensing a single product from the column A and removing established credit by opening a set of contacts 64, 66 of solenoid switch 11A so as to break the holding circuit for vend relay 18.

Upon de-energization of vend relay 18, the energizing circuit for the operating coil 85 of alternator relay 45 is broken, causing it to be switched from the first to second position. It should be recalled that the alternator relay employed in this arrangement is of the type capable of transition from the first to second, or second to first position upon de-energization of the operating coil.

With the alternator relay 45 kept in its second position, actuation of selector switch 15A-B will complete the energizing circuit for vend solenoid 10B through vend switch 17, line 35, one or more of the soldout switches 13, line 34, the series arranged lower set of contacts 66, 64 of solenoid switches 11A-B to 11F, line 33, the series arranged upper set of contacts 70, 69 of selector switches 15F-15C, a set of lower contacts 70, 72 of selector switch 15A-B, line 49, the normally closed contacts 36, 38 of soldout switch 12A, lines 48, 67, and 105, the normally closed contacts 40, 41 of soldout switch 12B', line 100, vend solenoid 10B, line 98, a set of contacts 89, 91 of alternator relay 45, line 74, a set of contacts 53, 57 of vend relay 18 and line 75. As previously described, energization coil of vend solenoid 10B remains energized until the vend relay is de-energized which occurs upon discharge of capacitor 23. De-energization of vend relay 18 causes de-energization of the operating coil 85 of alternator relay 45, resulting in a transition of the alternator relay from the second to first position.

As repeated selections of the products stored in columns A and B are made, the products will continue to be dispensed, one at a time, alternately from one of the two columns A and B under control of alternator relay

45 and the common selector switch 15A-B. When the original contents of the column B become empty, the movable contact arm 40 of soldout switch 12B' will be caused to separate from fixed contact 41 and engage a second fixed contact 42, which is dead ended, so as to automatically interrupt the enabling circuit to vend solenoid 10B. When this occurs, further dispensing of products from the column B will be stopped and selective dispensing from column A will begin and continue in response to repeated customer actuations of the selector switch 15A-B. Although in this case, the alternator relay 45 is switched alternately between the first and second positions in response to each actuation of selector switch 15A-B, since the movable contact 36 of soldout switch 12B will also shift into engagement with the fixed contact 39 of this switch upon depletion of the column B, so as to automatically bypass the alternator relay 45 and establish an enabling circuit through lines 74, 73 and 106, contacts 39 and 36 of soldout switch 12B and line 95 to the vend solenoid A, then, dispensing of products from column A will continue in response to actuations of selector switch 15A-B irrespective of the operative position of alternator relay 45. When the contents of column A are fully depleted or sold out, soldout switch 12A is actuated to break the enabling circuit for vend solenoid 10A. Simultaneously, the soldout switch 13A-B is actuated to illuminate soldout indicator light 14A-B indicating that there is no supply of products in the columns A and B.

As previously noted, the invention is also applicable to other types of prior art vending machines and vending machine control circuits in addition to the circuit specifically embodied herein. It should also be understood that the invention could also be applied to a second pair of columns of the same vending machine, as where beverages of two different popular flavors are stored in two columns each of the vending machine. Although the invention has been described in connection with the embodiment including a DPDT alternator relay, it should be understood that more than two product unit columns could be placed under control of a single selector switch so as to effect alternate dispensing of product units therefrom by operation of a relay which is movable selectively between the more than two positions in response to each actuation of the single selector switch. Accordingly, while the invention has been described with reference to a particular embodiment, changes or modifications may now be suggested to those skilled in the art without departing from the present inventive concept or scope of the subjoined claims.

What is claimed is:

1. In a control circuit for a coin operated vending machine having a plurality of columns of articles to be selectively dispensed by operation of a corresponding dispensing actuator in response to actuation of a corresponding selector switch, the improvement comprising a relay for controlling alternate energization of the dispensing actuators for at least two cooperating columns of said plurality of columns, said relay having a plurality of positions each corresponding to one of said cooperating columns, said relay being movable alternately between said plurality of positions in response to each vending of articles from said cooperating columns, said relay in each of said plurality of positions being connected to the dispensing actuator for a corresponding one of said cooperating columns, the dispensing actua-

tors of said cooperating columns being electrically connected to a single one of said selector switches, whereby alternate dispensing of articles from one of said cooperating columns is effected in response to each actuation of said single selector switch.

2. The control circuit as set forth in claim 1, wherein said relay comprises an alternator relay movable alternately between a first position and a second position in response to each vending of articles in a pair of cooperating columns, whereby alternate dispensing of articles from one of said pair of cooperating columns is effected in response to each actuation of said single selector switch.

3. The control circuit as set forth in claim 2, wherein said alternator relay includes two sets of contacts, each comprising a movable contact and a fixed contact, one of said movable contacts being electrically connected to the dispensing actuator for one column of said pair of cooperating columns, the other of said movable contacts being electrically connected to the dispensing actuator for the other column of said pair of cooperating columns, said dispensing actuators of said pair of cooperating columns being electrically connected to said single selector switch, said selector switch being electrically connected to one of a pair of power lines, said fixed contacts being electrically connected together to the other of said power lines.

4. The control circuit as set forth in claim 2, further comprising a soldout switch provided for each of said pair of cooperating columns, each of said soldout switches being electrically connected in series with the dispensing actuator for an associated one of said pair of cooperating columns, said soldout switches being adapted to break the energizing circuit for their associated dispensing actuators in response to depletion of articles in their associated columns.

5. The control circuit as set forth in claim 2, further comprising a soldout switch connected in series with the dispensing actuator for one of said pair of cooperating columns, said soldout switch being adapted to bypass said alternator relay and connect said dispensing actuator across a pair of power lines in response to depletion of articles in the other column of said pair of cooperating columns, whereby article dispensing from only the one column of said pair of cooperating columns begins and continues in response to each actuation of said single selector switch after depletion of articles in the other column.

6. The control circuit as set forth in claim 5, wherein said soldout switch includes a pair of fixed contacts and a movable contact, one of said fixed contacts being electrically connected to one movable contact of said alternator relay, the other of said fixed contacts being electrically connected to the fixed contacts of said alternator relay, said movable contact of said auxiliary soldout switch being electrically connected to the dispensing actuator for the one of said pair of cooperating columns.

7. A control circuit for a coin operated vending machine comprising a plurality of dispensing actuators, a plurality of selector switches, a plurality of columns of articles to be selectively dispensed upon operation of a corresponding dispensing actuator in response to actuation of an associated selector switch, at least one on said selector switches being connected for energizing, alternately, two of said dispensing actuators, the other of said selector switches being individually connected

for energization of a single dispensing actuator, an alternator relay having a first position and a second position, said alternator relay being movable alternately between said first and second positions in response to each alternate vending of an article from the two interconnected columns, said alternator relay in its first position being electrically connected to the dispensing actuator for one column of said two interconnected columns and in its second position being electrically connected to the dispensing actuator for the other column of said two interconnected columns whereby alternate dispensing of articles from one of said two interconnected columns is effected in response to each actuation of said single selector switch.

8. The control circuit as set forth in claim 7, wherein said alternator relay includes two sets of contacts, each comprising a movable contact and a fixed contact, one of said movable contacts being electrically connected to the dispensing actuator for one column of said pair of cooperating columns, the other of said movable contacts being electrically connected to the dispensing actuator for the other column of said two interconnected columns, said dispensing actuators of said two interconnected columns being electrically connected to said single selector switch, said selector switch being electrically connected to one of a pair of power lines, said fixed contacts being electrically connected together to the other of said power lines.

9. The control circuit as set forth in claim 7, further comprising a soldout switch provided for each of said two interconnected columns, each of said soldout switches being electrically connected in series with the dispensing actuator for an associated one of said two interconnected columns, said soldout switches being adapted to break the energizing circuit for their associated dispensing actuators in response to depletion of articles in their associated columns.

10. The control circuit as set forth in claim 8, further comprising a soldout switch connected in series with the dispensing actuator for one column of said two interconnecting columns, said auxiliary soldout switch being provided for the other column of said interconnected columns to bypass said alternator relay and connect said dispensing actuator of the one column across a pair of power lines in response to depletion of articles in the other column, whereby article dispensing from only the one column of said pair of cooperating columns begins and continues in response to each actuation of said single selector switch after depletion of articles in the other column, irrespective of the position of said alternator relay.

11. The control circuit as set forth in claim 10, wherein said soldout switch includes a pair of fixed contacts and a movable contact, one of said fixed contacts being electrically connected to one movable contact of said alternator relay, the other of said fixed contacts being electrically connected to the fixed contacts of said alternator relay, said movable contact of said auxiliary soldout switch being electrically connected to the dispensing actuator for the one column of said two interconnected columns.

12. In a control circuit for a coin operated vending machine having a plurality of columns of articles to be selectively dispensed by operation of a corresponding dispensing actuator, each said actuator adapted to be energized in response to actuation of an associated selector switch, the improvement comprising switching

means for controlling alternate energization of the dispensing actuators for at least two columns of said plurality of columns, said switching means having at least a first and a second position, said first position establishing an energizing circuit for an actuator associated with one of said two columns, said second position establishing an energizing circuit for an actuator associated with the other of said two columns, said switching means being movable alternately between said first and second positions in response to each vend of an article in one of said columns, said means in each of said first and second positions being electrically connected to the dispensing actuator for a corresponding one of said cooperating columns, the dispensing actuators of said two columns being electrically connected to a single one of said selector switches, whereby alternate dispensing of articles from one of said cooperating columns is effected in response to each actuation of said single selector switch.

13. In a control circuit for a coin operated vending machine having a plurality of columns each adapted to receive articles to be selectively dispensed, a plurality of selector switches each associated with at least one column of said plurality of columns, a coin operated vend switch, a vend relay adapted to be momentarily energized upon operation of said vend switch, means for establishing a holding circuit for said vend relay upon energization thereof, means for maintaining said

vend relay energized a predetermined time upon actuation of one of said selector switches, and a plurality of dispensing actuators each adapted to be energized upon energization of said vend relay and actuation of one of said selector switches to dispense a single article from one of the columns, the improvement comprising an alternator relay movable alternately between a first position and a second position upon de-energization of said vend relay, said alternator relay in its first position being electrically connected to the dispensing actuator for one of a pair of associated columns and in its second position being electrically connected to the dispensing actuator for the other of said pair of associated columns, said dispensing actuators of said pair of associated columns being electrically connected to a single one of said selector switches, whereby alternate dispensing of articles from one of said pair of columns is effected in response to each actuation of said single selector switch.

14. The control circuit as set forth in claim 13, wherein said alternator relay includes an operating coil, said vend relay having a set of contacts adapted to close upon energization of said vend relay, said operating coil of said alternator relay being electrically connected to one of said set of contacts such that said alternator relay is de-energized upon de-energization of said vend relay.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,836,046 Dated September 17, 1974

Inventor(s) Raymond D. Bowman

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 7, column 9, line 65 "on" should read -- of --.

Column 10, line 2, after "having," insert -- contacts movable between --.

Signed and sealed this 14th day of January 1975.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents