United States Patent

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[54] **ELECTRONIC COMPUTERIZED VENDING SYSTEM**
21 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **194/10**
[51] **Int. Cl.** **G07f 11/00**
[50] **Field of Search** 194/10

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ABSTRACT: An electronic coin-operated vending system including switches operated by coins of different assigned denominations, a circuit for producing a number of pulses signifying the value of the deposited coins, a counter and decoder-driver circuit for energizing contacts signifying the number of those pulses, item selector switches and a pulse generating circuit controlled thereby for producing and applying to the counter a second group of pulses signifying the price of the item selected, and a deposit sufficiency circuit connected to the decoder-driver to activate the item vend mechanism when the total pulse count signifies that the coin deposit equals or exceeds the item price. Coin return and change return features are also provided.

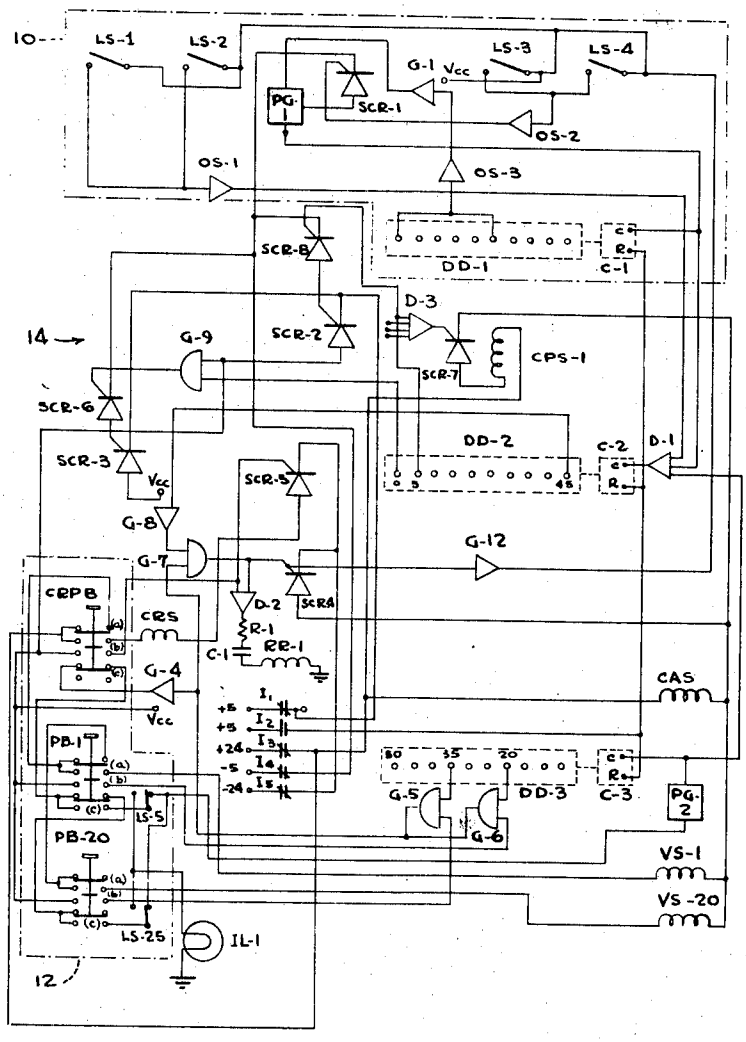
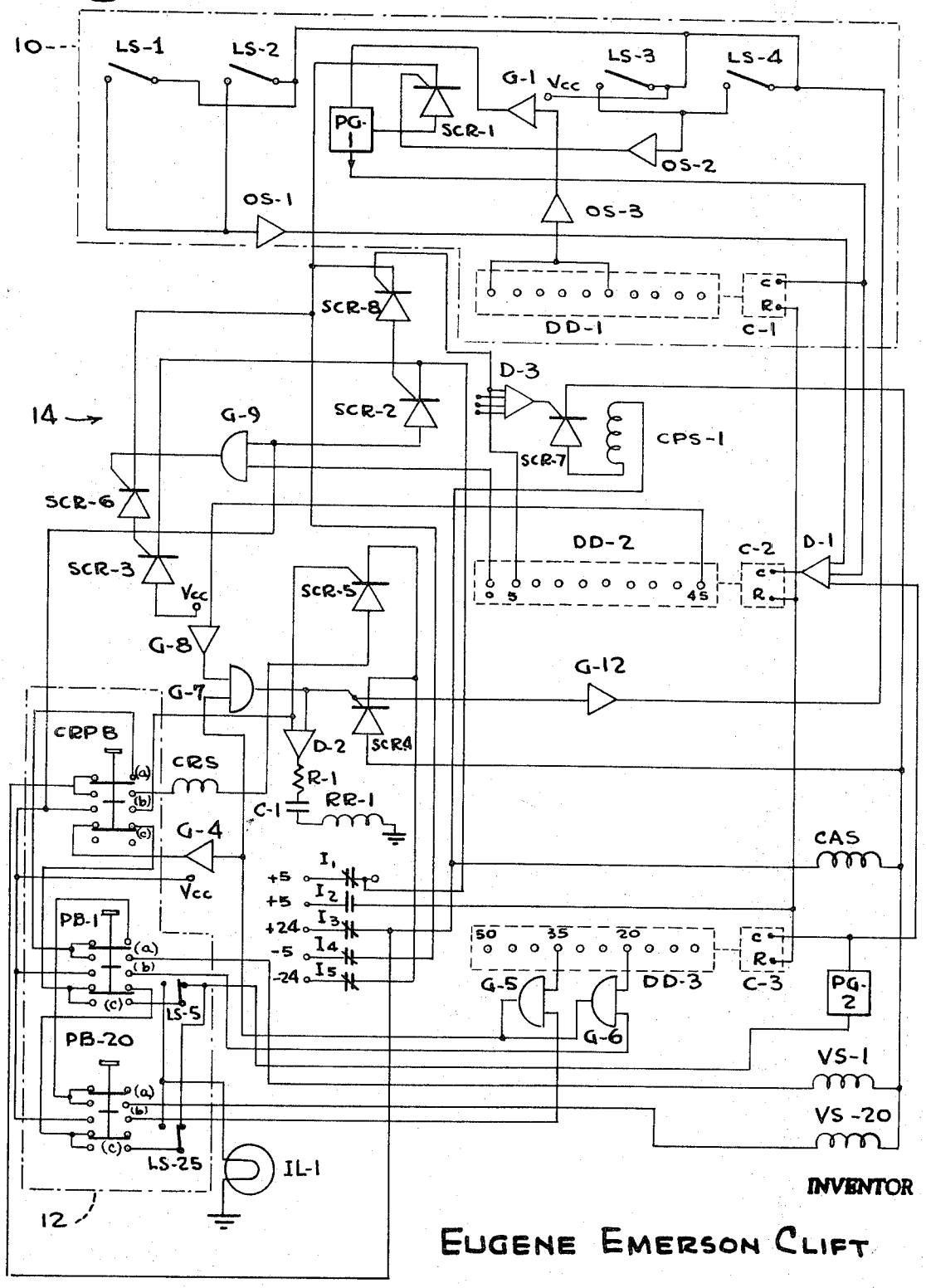


Fig-1



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FIG-2

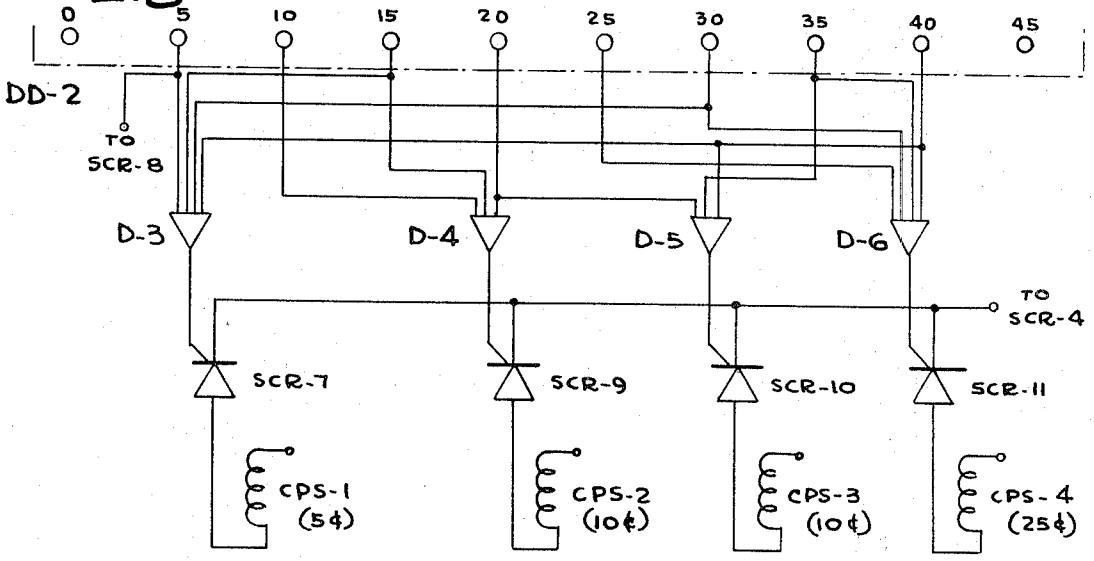


FIG-3

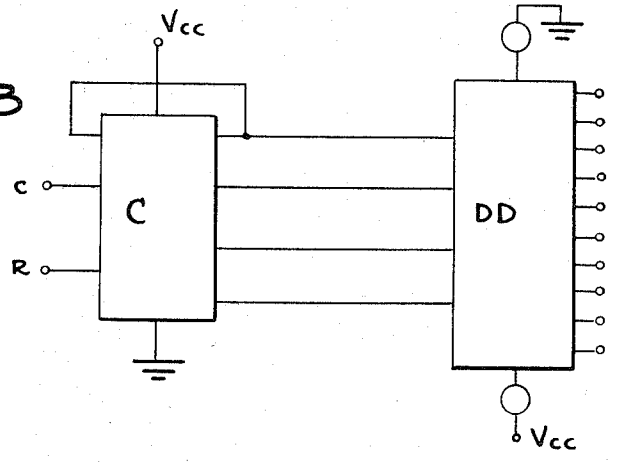
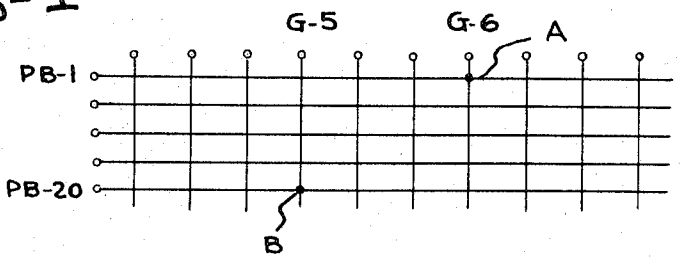


FIG-4



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ELECTRONIC COMPUTERIZED VENDING SYSTEM

SUMMARY OF THE INVENTION

The present invention relates to a coin operated electronic computerized vending system for use with vending machines to provide for the selection and vending of any one of a multiplicity of items at a multiplicity of prices after deposit of combinations of coins and which has the capacity to return the correct change in the highest denominations possible. The system of the present invention is designed to operate in conjunction with commercially available coin slug rejectors and channeling devices, including their associated limit switches, coin accept and coin return solenoids, and with the vend solenoids and associated vending mechanisms of the conventional vending machine. The counting, information storage, selecting and decision functions for operating the vending machine are made by the system of the present invention designed to operate with tiny, high speed, long life integrated circuit modules.

The present invention includes multiple coin deposit and encoding circuits for producing numbers of pulses bearing selected relation to the denomination of the coins deposited, which pulses are applied to a coin deposit storage counter and associated decoder-driver for establishing certain output contact conditions signifying the total value of the deposited coins. Multiple pushbuttons permit the selection, after the deposit of coins, of any of a variety of items at any of a variety of prices. Each item select pushbutton has output contacts leading to the proper vend solenoid, to the proper item price gate, and to a common pulse generator which advances an item price selector counter and its associated decoder-driver to a gate contact associated with the particular selection made, at which point power to the pulse generator is terminated. The pulse generator also advances the coin deposit storage counter from its total deposit position an equal number of steps to cause the storage counter to advance back to its "O" position to establish a deposit sufficiency circuit for completing the supply to the vend solenoid permitting vending of the selected item. If the coin deposit storage counter and its decoder-driver are advanced beyond the "O" contact, the proper change return will be made through change return circuits and solenoids. If an insufficient deposit is made, the customer can activate a coin return pushbutton and get the deposit back, or can make additional deposits to establish sufficiency and permit a vend. Means are provided to reset the system after each vend or when the coin return pushbutton is activated.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a diagrammatic illustration of a coin operated vending machine control circuit embodying the present invention, with parts shown in schematic form and parts shown in block diagram form;

FIG. 2 is a schematic illustration of the payout circuitry for 5 cents to 40 cents, showing the diodes necessary to isolate the input circuits to prevent feed backs;

FIG. 3 is a block diagram illustration of a typical commercially available integrated circuit binary counter and associated decoder-driver showing wiring connections, to form the coin deposit storage, coin deposit encoding and item price selector counters and decoder-drivers of the present invention, and

FIG. 4 is a schematic illustration of a commercially available crossbar switch which may be used to permit item price changes.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIG. 1, and particularly to the coin deposit encoding section 10, illustrated in the upper portion thereof, there are shown four limit switches LS–1, LS–2, LS–3 and LS–4, which form part of the conventional coin channeling and slug rejector devices of conventional vending machines.

Limit switch LS–1 is mechanically tripped by deposit of a nickel, momentarily closing its contacts to activate a one-shot integrated circuit multivibrator OS–1 which produces a single pulse of the proper width and applies the same to one of the inputs of a three input diode module D–1 which applies this pulse to the count contact of a coin deposit storage binary counter C–2, which in turn activates its associated decoder-driver DD–2. By use of conventional channeling devices in coin operated chute mechanisms, deposit of a dime is caused to trip limit switch LS–1 and is then channeled to limit switch LS–2 to close the latter and thus result in two count pulses being applied from the multivibrator OS–1 to the diode D–1 and the count contact of the coin deposit storage counter C–2. Deposit of a quarter trips the limit switch LS–3, which activates the one-shot multivibrator OS–2 to produce a single pulse and turns on the silicon controlled switch SCR–1. This starts a self-starting, free-running oscillator PG–1, designed to produce pulses at pulse frequency that will be campatible with the various components used in the logic circuitry. The pulse generator PG–1 drives both the coin deposit storage counters C–2 and a coin deposit encoding counter C–1, and their associated decoder-drivers DD–2 and DD–1, respectively. After a count of five pulses by the counter C–1, its decoder-driver DD–1 stands on the five count contact and sends a pulse to the one-shot multivibrator OS–3, which sends a single pulse of appropriate width to the NOT gate G–1 to momentarily turn off the power to pulse generator PG–1. This results in dropping out of the silicon controlled rectifier SCR–1, halting the generation of pulses by pulse generator PG–1 until SCR–1 is triggered again. In the circuitry herein illustrated, a DC–bias circuit is required to trigger the SCRs and turn-off is obtained by interrupting the cathode-to-anode current, the load circuit. By the above-described arrangement, it will be apparent that deposit of a quarter and activation of the limit switch LS–3 in response thereto results in the production of five pulses applied to the counters C–1 and C–2. Similarly, deposit of a half dollar first trips the limit switch LS–3, causing five pulses to be generated in the manner just described, and the coin is then channeled to trip the limit switch LS–4, causing another five pulses to be generated in the same manner, thus resulting in a total of ten pulses being applied to the coin deposit storage counter C–2.

It will be apparent, therefore, that the coin deposit encoding counter C–1 and its associated decoder-driver DD–1 is activated only upon deposit of quarters or half dollars to achieve the production of five pulses or ten pulses by the pulse generator PG–1, and that the pulses resulting from the deposit of nickles, dimes, quarters and half dollars will be applied to the coin deposit storage counter C–2 and its associated decoder-driver DD–2 to cause the latter to stand on a contact signifying the total value of the coins deposited. It will be noted that the three input diode module D–1 is provided in the input to the storage counter C–2 to block application of the coin encoding pulses to the item price selector counter C–3 to be later described.

Referring now to the pushbutton section 12 in the lower portion of FIG. 1, the system also includes a coin return pushbutton CRPB and a plurality of item selector pushbuttons, only two of such item selector pushbuttons, PB–1 and PB–20, being shown to simplify explanation of the invention. These are all triple circuit, double break switches, forming part of the vending device. It will be understood that any reasonable number, for example, twenty or more, item selector pushbuttons may be provided in the normal vending machine, each of which would be connected to its associated vend solenoid and to the control circuitry in a manner similar to the connections shown for the pushbuttons PB–1 and PB–20.

It will be observed that the input to the first operational contact *a* of the item selector switches are wired in series through the coin return pushbutton CRPB to prevent multiple selections or a selection plus the return of the money deposited. The output from the first contact *a* from the coin return pushbutton CRPB forms a circuit to the coil of the coin return sole-

noid CRS. The outputs from the first contacts *a* of the item selector pushbuttons PB–1 and PB–20 connect to the coils of the vend solenoids VS–1 and VS–20, respectively. Although power is available to one side of the coin return solenoid or the vend solenoids upon making of these first contacts of either of the pushbuttons CRPB, PB–1 or PB–20, a vend or coin return operation is not possible until after certain criteria have been established by the logic circuit, as will be explained hereinafter.

The output from the second contact *b* of the coin return pushbutton CRPB, when activated, provides a power circuit to fire the silicon controlled switch SCR–5, which in turn provides power to the other side of the coin return solenoid CRS. This second contact circuit of pushbutton CRPB also connects to a blocking diode module D–2, which is in an RC circuit connecting with the coil of reset reed relay RR–1, which when pulled in will reset the various circuits, as later described. The RC circuit, including resistor R–1 and capacitor C–1, connected to the reed relay RR–1, are to delay the activation of this relay long enough to permit a single activation of the proper solenoids of the vending machine, such as the solenoids CRS, VS–1 or VS–20. The activation delay time would depend on the vending requirements of the particular vending device with which the system of the present invention is used.

The input to the second contact *b* of the item selector pushbuttons PB–1 and PB–20 is the same as that to the second contact of the coin return pushbutton CRPB. The outputs from the *b* contact of the item selector pushbuttons PB–1 and PB–20 complete a circuit to item price selector AND gates G–6 and G–5, respectively. The other input to these two AND gates G–6 and G–5 are provided by the decoder-driver DD–3 associated with the item price selector counter C–3. The decoder-driver DD–3 is arbitrarily wired in reverse or the reciprocal of the decoder-driver DD–2 of the coin deposit storage counter, the "O" contact of decoder-driver being connected to the 50 cent item price selector gate (not shown), the fourth contact from the start position being connected to the 35 cent item price gate G–5, and the seventh contact being connected with the 20 cent price selector gate G–6. It will be apparent that if two inputs are present at any one time on any of the item price selector gates, that particular two-input AND gate would be activated. This in turn will send a pulse to the NOT gate G–4, cutting off the power being supplied in a series circuit to the third input contacts *c* of the coin return pushbutton CRPB, and to the third contacts *c* of the item selector pushbuttons PB–1 and PB–20.

The outputs from the third contacts *c* of both of the item selector switches PB–1 and PB–20 connect through a common circuit to the pulse generator PG–2, which is identical to the previously described pulse generator PG–1. The third contacts *c* of the coin return pushbutton CRPB are included in this circuit to break the pulse generator circuit when the coin return pushbutton is activated. Included in the third contact output circuits of item selector switches PB–1 and PB–20 are limit switches LS–5 and LS–25, which are normally included as part of a conventional modern vending machine, the open contacts of which provide a common circuit to indicator light IL–1 to inform the customer that the item selected is "sold out," and to also break the circuit to the pulse generator PG–2 to prevent its activation. The customer then can make another item selection attempt, or activate the coin return pushbutton.

The inter-relation of the coin deposit encoding section 10, the pushbutton section 12 and the logic section 14 will be understood from the following explanation, assuming that a total of 35 cents has been deposited. Assuming that the coins deposited were a dime and a quarter, the dime would have activated the coin device limit switches LS–1 and LS–2 to produce two pulses at the output of multivibrator OS–1 and the limit switch LS–3 would have caused the pulse generator PG–1 to produce five pulses, which collectively were applied to the coin deposit storage counter C–2 and advanced its associated decoder-driver DD–2 from its first contact or "O" position to its eighth contact or 35 cent position. Assuming that a 35 cent item was selected by activating the item selector pushbutton PB–20, the first contact *a* of the switch PB–20 provides one side of the circuit to the vend solenoid coil VS–20. The second contact *b* of the item selector switch PB–20 provides one of two inputs needed to operate the item price selector AND gate G–5. The third contact *c* of the item selector switch PB–20 activates the pulse generator PG–2 which provides count pulses to the item price selector counter C–3, advancing its associated decoder-driver DD–3 from its first or "home" (50 cent item) position to its fourth or 35 cent contact position, at which point a pulse is sent to the second input of gate G–5. Since the other input to the gate G–5 is already present, the gate G–5 now sends a pulse to the NOT gate G–4, which had been providing power to the third contact of selector switch PB–20 through the third contact of the coin return pushbutton CRPB. Application of the pulse to the NOT gate G–4 interrupts the power circuit to the third contact of switch PB–20 and thus shuts off the pulse generator PG–2 at this point. The three pulses thus generated by the pulse generator PB–2 were also applied through the diode D–1 to the coin deposit storage counter C–2, advancing its associated decoder-driver D–2 another three steps. As a result, the three step count by the counter C–2 returns this counter and its associated decoder-driver DD– 2 back to its "O" or first contact position. This is used to establish sufficiency of deposit by a circuit from this "O" contact of the decoder-drive DD–2 to AND gate G–9, having one of its inputs connected to the "O" contact of the decoder-driver DD–2.

During the initial advance of the decoder-driver DD–2 from its "O" contact in response to deposit of the 35 cents, it will be noted that the decoder-driver DD–2 was advanced past its second or 5 cent contact, momentarily closing this contact and firing the silicon controlled switch SCR–8 connected thereto, which then triggered the silicon controlled switch SCR–2 providing one input to AND gate G–9 which, when activated by an additional input from the zero contact of DD–1, fires the silicon controlled switch SCR–6 used to store the sufficiency count. The output of SCR–2 also provides power to the second input contacts of CRPB and selector switches PB–1 and PB–20 and to the *Vcc* contact of NOT gate G–4 which permits it to provide power to the third input contacts of the above switches. Thus, power to these switch contacts is available only after the deposit of a coin. SCR–6 in turn fires the negative triggered silicon controlled switch SCR–3, which is used to obtain positive power to the *Vcc* contact of the NOT gate G–8, permitting this gate to conduct and provide one of the inputs to the vend decision AND gate G–7. The other input to the vend decision AND gate G–7 is provided by the item price selector AND gate G–5 or G–6 when activated. Activation of the gate G–7 triggers the silicon controlled switch SCR–4 which provides the proper current to the other side of the vend solenoid VS–20, permitting a vend, and also provides proper current to the other side of the coin accept solenoid CAS to activate this solenoid.

It should be noted here that, for simplicity of understanding, controlled *Vcc* inputs to NOT gates, such as gates G–1, G–4 and G–8, are shown as being adjacent these gates, while the *Vcc* to the gates which do not have their *Vcc* controlled is not shown.

It will be apparent, therefore, that during the initial advancement of the decoder-driver DD–2 in response to deposit of the 35 cents, the momentary closing of the one position or 5 cent contact triggers the silicon controlled switches SCR–8 and SCR–2 to provide one of the inputs to the sufficiency AND gate G–9, and the further advancement of the decoder-driver DD–2 in response to the three pulses produced by the pulse generator PG–2, upon activation of the selector switch PB–20, causes the decoder-driver DD–2 to advance three more steps from the 35 cent position to the "O" position, providing the other input from the "O" contact to the AND gate G–9. Activation of the AND gate G–9 effects triggering of the silicon controlled switches SCR–6, SCR–3, gates G–8 and G–7, and switch SCR–4 to provide current to the other

side of the appropriate vend solenoid VS–20 and the coin accept solenoid CAS to activate these two solenoids.

In addition, activation of the vend decision AND gate G–7 also energizes a circuit through the diode D–2 to the reset reed relay RR–1 to reset the various stages after the time delay introduced by the RC circuit formed of R–1 and C–1. For example, the reed relay RR–1 may have a plurality of contacts, such as to normally closed contacts I–1 to which a positive input is applied to provide the positive Vcc pulse to most of the integrated circuit modules, normally open contacts I–2 to which a positive input is applied to reset the binary counters C–1, C–2 and C–3 when the reed relay is activated, normally closed contacts I–3 to which a positive input is applied to meet the power requirements of various solenoids in the vending unit, such as the coin accept solenoid CAS shown connected to these contacts in FIG. 1, contacts I–4 to apply a negative input to the cathodes of positive triggered SCRs used in the logic circuit, and contacts I–5 to apply a negative input to SCR–4 and SCR–5 to operate various solenoids, as indicated in the vending system.

To illustrate operation of the system when an excessive value of coinage is deposited by the customer, assume that four dimes or 40 cents is inserted in the coin chutes and the item selector switch PB–20 for a 35 cent item is activated. Deposit of the four dimes will activate the coin operated limit switches LS–1 and LS–2 to produce a total of eight pulses applied to the counter C–2 and advance the associated decoder-driver DD–2 to its ninth contact, or 40 cent position. Activation of the selector switch PB–20 will cause the pulse generator PG–2, in the manner previously described, to produce a three pulse count, further advancing the counter C–2 and decoder-driver DD–2 through an additional three steps past the "O" contact position, where a sufficiency count is established, and one additional step to the 5 cent contact position. The additional pulse from the 5 cent contact of decoder-driver DD–2 to the silicon controlled switch SCR–8 will have no effect, since it was previously fired by the first coin deposited. However, there is an additional circuit from the 5 cent contact of decoder-driver DD–2 to silicon control switch SCR–7 through one input of the four input diode D–3, shown also in FIG. 2, which will fire for the first time after the negative current to its cathode is supplied by silicon controlled switch SCR–4, thereby pulling in the 5 cent or nickle pay-out solenoid CPS–1. The action of silicon controlled switch SCR–4 also completes the operation of the vend solenoid VS–20 and the coin accept solenoid CAS as previously described. Thus, a 35 cent item is vended and the correct change, 5 cents, is returned after the deposit of 40 cents.

Additional circuitry similar to that provided for the 5 cent or nickle pay-out, as illustrated in FIG. 2, may be provided to return appropriate change when the amount deposited exceeds the price of the item selected by greater amounts, operating in a manner similar to that of the circuit provided by the silicon controlled switch SCR–7 and the nickle pay-out solenoid CPS–1. For example, another silicon controlled switch SCR–9 connected to a dime pay-out solenoid CPS–2 could be connected through three input diode D–4 to the previously described nickle pay-out circuit and to the fourth contact or 15 cent position of the decoder-driver DD–2, and would be enabled by firing of the silicon controlled switch SCR–4. Thus, if 50 cents were deposited, this deposit would advance the decoder-driver DD–2 through its full range of contact positions and back to its "O" contact, immediately establishing sufficiency. If the selector switch PB–20, representing a 35 cent item, were then activated, the three pulse output from the pulse generator PG–2 would advance the decoder-driver DD–2 through three additional steps to its fourth contact, or 15 cent position, causing activation of the silicon controlled switch SCR–9 connected thereto to activate the dime pay-out solenoid CPS–2, as well as the five cent pay-out circuit, to give 15 cents change. In a similar manner, circuit connections may be made from the second and fourth contacts of the decoder-driver DD–2 through diode D–4 and SCR–9 to the dime pay-out solenoid CPS–2 and circuit connections from the fifth and higher numbered contacts of the decoder-driver DD–2 to another diode D–5 and SCR–10 to another dime pay-out solenoid CPS–3, and through diode D–6 and SCR–11 to a quarter pay-out solenoid CPS–4 and to the nickle and dime payout circuits in appropriate combinations as illustrated in FIG. 2 to effect appropriate change pay-outs. The diodes D–2, D–4, D–5 and D–6 form an integrated circuit diode array to isolate the coin pay-out inputs from decoder-driver DD–2 to prevent feedbacks. For example, diode D–3 contains inputs from the 15 cent, 30 cent, and 40 cent contacts of DD–2, as well as the 5 cent input, and unless each of these inputs were so isolated, all four would be linked in a common circuit.

If the customer deposited only a quarter, and a 35 cent item was selected, the activation of the coin operated limit switch LS–3 would have advanced the decoder-driver DD–2 to the sixth contact position, and the three pulses generated by the pulse generator PG–2 upon activation of the item selector switch P–20 would have advanced the decoder-driver DD–2 to only the ninth contact, so that sufficiency of deposit will not have been established. However, the NOT gate G–4 will have interrupted the pulse generator PG–2 so that no additional selection is possible. The customer then has a choice of pushing the coin return pushbutton CRPB to get back the deposit, or depositing two nickles or a dime which will advance the counter C–2 and its decoder-driver DD–2 to the "O" or sufficiency position. However, a deposit larger than the amount needed to achieve sufficiency will permit only a vend. The purpose of this restriction is to prevent multiple pay-outs by the firing of the various coin pay-out SCRs as the decoder-driver DD–2 advances after sufficiency has been established. This provision is obtained by NOT gate G–12, which is activated by gate G–7 and interrupts the power to the coin operated limit switches, as well as to the Vcc of NOT gate G–1, which is part of the circuit for the pulse generator PG–1. This situation cannot occur when a proper deposit is made, since the coin pay-out SCRs cannot fire until after the silicon control switch SCR–4 has fired.

While the deposit and price selecting capability can be increased beyond that herein described by way of example, by circuits operating in a manner similar to those hereinabove described, the circuitry of the present invention includes a provision for preventing excess depletion of the change banks by limiting change return to a selected denomination, for example, 40 cents. This is achieved by connecting the 45 cent contact of decoder-driver DD–2 to the NOT gate G–8 to interrupt the sufficiency circuit when activated. If the capability of the system is enlarged beyond that of the above-described example, this restriction on change return can be achieved by connecting all contacts of decoder-driver DD–2 higher than the 40 cent contact through a common circuit to the NOT gate G–8.

As another safeguard, it is desirable to wire the pushbuttons in order of the item prices with the smallest being first in the pushbutton series circuits.

Provision can be readily made for item price changes in a quick and efficient manner by including a conventional, commercially available crossbar switch of the type diagrammatically illustrated in FIG. 4 between the item selector switches, such as PB–1 and PB–20, and the item price selector gates G–5 and G–6. The conductors of the switch extending along one axis, for example, the horizontal axis illustrated in FIG. 4, are respectively connected to the item price selector switches, and the conductors extending along the other axis, for example, the vertical axis, are connected to the respective item price selector gates. It will be appreciated that additional item price selector gates, such as gates G–5 and G–6, will be connected between the respective vertical axis conductors and the contacts of the item price selector decoder-driver DD–3 indicating different price contacts. In FIG. 4, the point A indicates the interconnecting contact component of the crossbar switch between the horizontal axis conductor connected

to the selector switch PB–1 and the vertical conductor connected to the 20 cent price selector gate G–6; the point B represents the interconnecting contact at the crossover point between the horizontal axis conductor connected to the selector switch PB–20 and the vertical axis conductor connected to the 35 cent gate G–5. It will be apparent that by moving these interconnecting contact components of the crossbar switch along the associated horizontal axis conductor to different crossover points, the item price signified by the item selector switches can be readily changed.

I claim:

1. In an electronic coin-operated vending system including a plurality of manually operable item selector switches and vend solenoids respectively connected therewith, each associated with a different vend item, plural coin-operated switches activated by deposit of coins of different denominations, first encoding means operated by said switches including first pulse generator means for producing numbers of first pulses signifying the denomination of the deposited coins, first counter-decoder means coupled to said first encoding means for counting pulses applied thereto in a forward direction through a pulse counting cycle equal to a selected numeric modulus responsive to said first pulses and having a series of contacts equal to said modulus which are individually energized to signify the total value of the deposited coins, the money value of certain of said contacts corresponding to the prices of the vend items, second encoding means including second pulse generator means activated by operation of any of said selector switches for producing a number of second pulses equal to the number of contacts in the forward counting direction from the contact corresponding to the price of the chosen vend item to a first selected contact in said series of contacts, means for applying said second pulses to said counter-decoder means for advancing the same, and a deposit sufficiency circuit connected to said first selected contact and to said vend solenoids to activate the vend solenoid connected to the operated selector switch and effect vending of the associated item upon energization of said selected contact following advancement of said counter-decoder means responsive to said first pulses.

2. An electronic coin-operated vending system as defined in claim 1, wherein said first selected contact is the zero count position contact of said series of contacts, and the number of second pulses produced by said second encoding means corresponds to the number of pulse counting steps from the chosen item price signifying contact through completion of said pulse counting cycle and return to said zero count position contact.

3. An electronic coin-operated vending system as defined in claim 2, wherein said second encoding means includes second counter-decoder means having a number of price contacts equal to said numeric modulus for counting pulses applied thereto and advancing energization of said price contacts in descending value order from a maximum price initial contact, said second pulse generator means being connected to said second counter-decoder means to apply said second pulses thereto and activated responsive to operation of any of said selector switches to advance said second counter-decoder from said initial contact, and gate means connected to selected ones of said price contacts and to the respective selector switches for terminating operation of said second pulse generator means when their respective associated price contacts are energized and for activating said deposit sufficiency circuit.

4. An electronic coin-operated vending system as defined in Claim 3, including change-return solenoid means for discharging coins of selected denomination and control circuit means therefor, and means connecting said control circuit means with a second contact of said first counter-decoder of selected higher value than said first selected contact and with said deposit sufficiency circuit to activate said control circuit means to energize said coin-return solenoid means when the sum of said first and second pulses applied to said first counter-decoder means causes energization of said second contact following activation of said deposit sufficiency circuit.

5. An electronic coin-operated vending system as defined in claim 4, including relay means connected to said deposit sufficiency circuit for resetting said counter-decoder means to said first selected contact a selected delay interval following actuation of any of said vend solenoids.

6. An electronic coin-operated vending system as defined in claim 5, including means operative upon deposit of coins insufficient to activate the deposit sufficiency circuit and operation of any of said selector switches for disabling operation of said change-return solenoid means when supplemental coins are deposited achieving a total deposit larger than that required to activate said deposit sufficiency circuit.

7. An electronic coin-operated vending system as defined in claim 3, wherein said deposit sufficiency circuit includes a first AND gate having two inputs including one input supplied from said first selected contact, first trigger-operated circuit means connected to another contact of said series of contacts of higher value than said first selected contact to provide the other input for said first AND gate during advancement of said counter-decoder means responsive to said first pulses, second trigger-operated circuit means activated by said first AND gate to store a condition signifying satisfaction of selected deposit sufficiency criteria, third trigger-operated circuit means for activating said vend solenoids, and second AND gate means responsive to activation of said second trigger-operated circuit means and to completion of production of said second pulses to activate said third trigger-operated circuit means.

8. An electronic coin-operated vending system as defined in claim 1, wherein said second encoding means includes second counter-decoder means having a number of price contacts equal to said numeric modulus for counting pulses applied thereto and advancing energization of said price contacts in descending value order from a maximum price initial contact, said second pulse generator means being connected to said second counter-decoder means to apply said second pulses thereto and activated responsive to operation of any of said selector switches to advance said second counter-decoder from said initial contact, and gate means connected to selected ones of said price contacts and to the respective selector switches for terminating operation of said second pulse generator means when their respective associated price contacts are energized and for activating said deposit sufficiency circuit.

9. An electronic coin-operated vending system as defined in claim 8, including change-return solenoid means for discharging coins of selected denomination and control circuit means therefor, and means connecting said control circuit means with a second contact of said first counter-decoder of selected higher value than said first selected contact and with said deposit sufficiency circuit to activate said control circuit means to energize said coin-return solenoid means when the sum of said first and second pulses applied to said first counter-decoder means causes energization of said second contact following activation of said deposit sufficiency circuit.

10. An electronic coin-operated vending system as defined in claim 9, wherein said deposit sufficiency circuit includes a first AND gate having two inputs including one input supplied from said first selected contact, first trigger-operated circuit means connected to another contact of said series of contacts of higher value than said first selected contact to provide the other input for said first AND gate during advancement of said counter-decoder means responsive to said first pulses, second trigger-operated circuit means activated by said first AND gate to store a condition signifying satisfaction of selected deposit sufficiency criteria, third trigger-operated circuit means for activating said vend solenoids, and second AND gate means responsive to activation of said second trigger-operated circuit means and to completion of production of said second pulses to activate said third trigger-operated circuit means.

11. An electronic coin-operated vending system as defined in claim 9, including means operative upon deposit of coins insufficient to activate the deposit sufficiency circuit and opera-

tion of any of said selector switches for disabling operation of said change-return solenoid means when supplemental coins are deposited achieving a total deposit larger than that required to activate said deposit sufficiency circuit.

12. An electronic coin-operated vending system as defined in claim 8, wherein said deposit sufficiency circuit includes a first AND gate having two inputs including one input supplied from said first selected contact, first trigger-operated circuit means connected to another contact of said series of contacts of higher value than said first selected contact to provide the other input for said first AND gate during advancement of said counter-decoder means responsive to said first pulses, second trigger-operated circuit means activated by said first AND gate to store a condition signifying satisfaction of selected deposit sufficiency criteria, third trigger-operated circuit means for activating said vend solenoids, and second AND gate means responsive to activation of said second trigger-operated circuit means and to completion of production of said second pulses to activate said third trigger-operated circuit means.

13. An electronic coin-operated vending system as defined in claim 8, including relay means connected to said deposit sufficiency circuit for resetting said counter-decoder means to said first selected contact and to said initial contact a selected delay interval following actuation of any of said vend solenoids.

14. An electronic coin-operated vending system as defined in claim 1, including change-return solenoid means for discharging coins of selected denomination and control circuit means therefor, and means connecting said control circuit means with a second contact of said first counter-decoder of selected higher value than said first selected contact and with said deposit sufficiency circuit to activate said control circuit means to energize said coin--return solenoid means when the sum of said first and second pulses applied to said first counter-decoder means causes energization of said second contact following activation of said deposit suffiency circuit.

15. An electronic coin-operated vending system as defined in claim 14, wherein said deposit sufficiency circuit includes a first AND gate having two inputs including one input supplied from said first selected contact, first trigger-operated circuit means connected to another contact of said series of contacts of higher value than said first selected contact to provide the other input for said first AND gate during advancement of said counter-decoder means responsive to said first pulses, second trigger-operated circuit means activated by said first AND gate to store a condition signifying satisfaction of selected deposit sufficiency criteria, third trigger-operated circuit means for activating said vend solenoids, and second AND gate means responsive to activation of said second trigger-operated circuit means and to completion of production of said second pulses to activate said third trigger-operated circuit means.

16. An electronic coin-operated vending system as defined in claim 14, including relay means connected to said deposit sufficiency circuit for resetting said counter-decoder means to said first selected contact a selected delay interval following actuation of any of said vend solenoids.

17. An electronic coin-operated vending system as defined in claim 14, including means operative upon deposit of coins insufficient to activate the deposit sufficiency circuit and operation of any of said selector switches for disabling operation of said change-return solenoid means when supplemental coins are deposited achieving a total deposit larger than that required to activate said deposit sufficiency circuit.

18. An electronic coin-operated vending system as defined in claim 1, wherein said deposit sufficiency circuit includes a first AND gate having two inputs including one input supplied from said first selected contact, first trigger-operated circuit means connected to another contact of said series of contacts of higher value than said first selected contact to provide the other input for said first AND gate during advancement of said counter-decoder means responsive to said first pulses, second trigger-operated circuit means activated by said first AND gate to store a condition signifying satisfaction of selected deposit sufficiency criteria, third trigger-operated circuit means for activating said vend solenoids, and second AND gate means responsive to activation of said second trigger-operated circuit means and to completion of production of said second pulses to activate said third trigger-operated circuit means.

19. An electronic coin-operated vending system as defined in claim 18, including relay means connected to said deposit sufficiency circuit for resetting said counter-decoder means to said first selected contact a selected delay interval following actuation of any of said vend solenoids.

20. An electronic coin-operated vending system as defined in claim 1, including relay means connected to said deposit sufficiency circuit for resetting said counter-decoder means to said first selected contact a selected delay interval following actuation of any of said vend solenoids.

21. An electronic coin-operated vending system as defined in claim 1, including a manually operable coin return switch, means interconnecting said coin return switch with said item selector switches to disable the latter when said coin return switch is actuated.