June 26, 1962 M. LEVINE 3,040,928

ALTERNATE COLUMN SELECTOR FOR MULTIPLE COLUMN VENDING MACHINES

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FIG. 1.

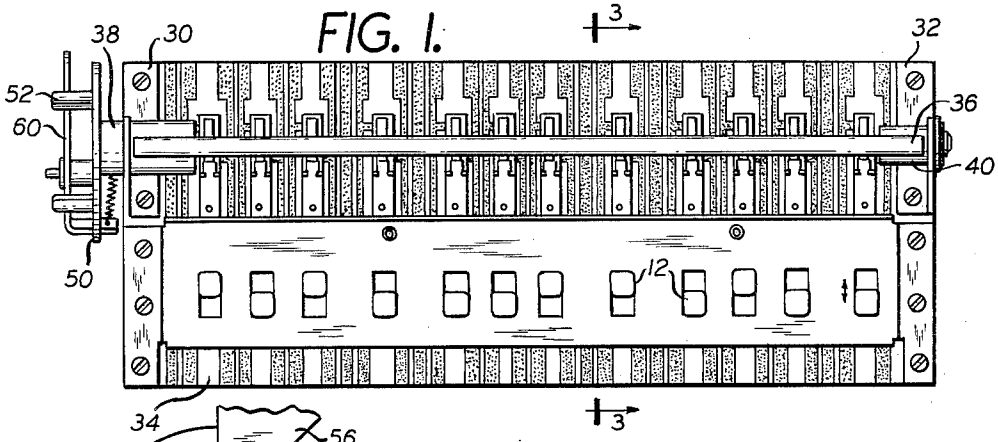


FIG. 2.

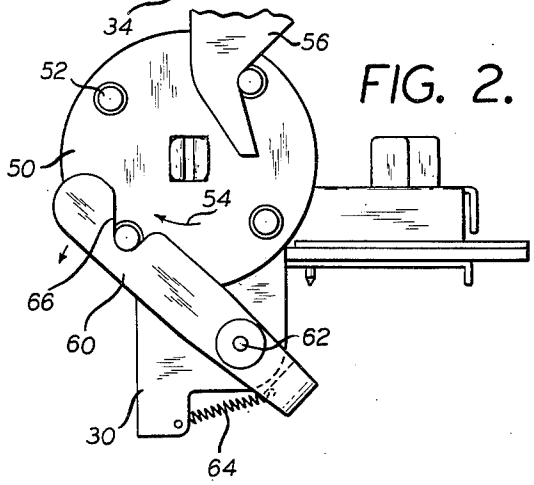


FIG. 4.

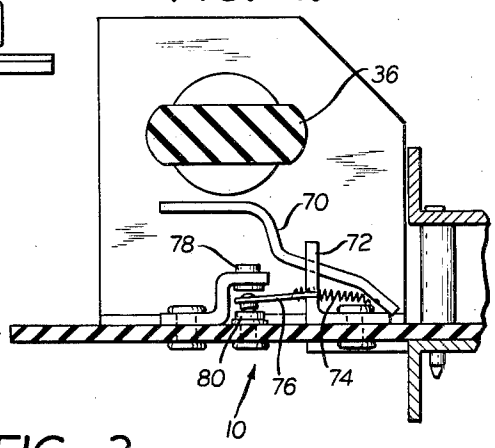
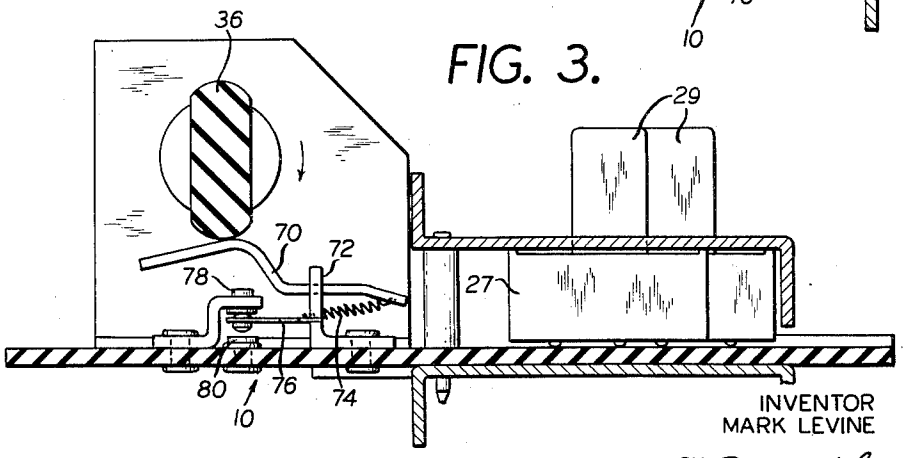


FIG. 3.



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FIG. 5.

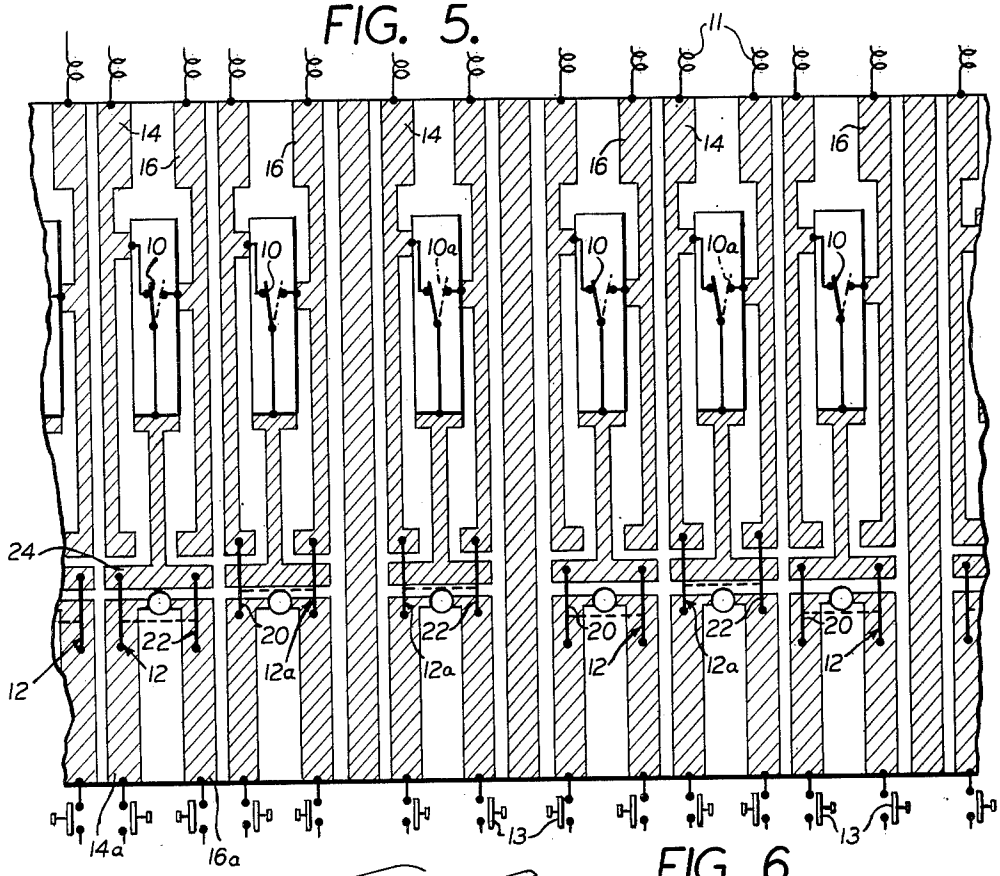


FIG. 6.

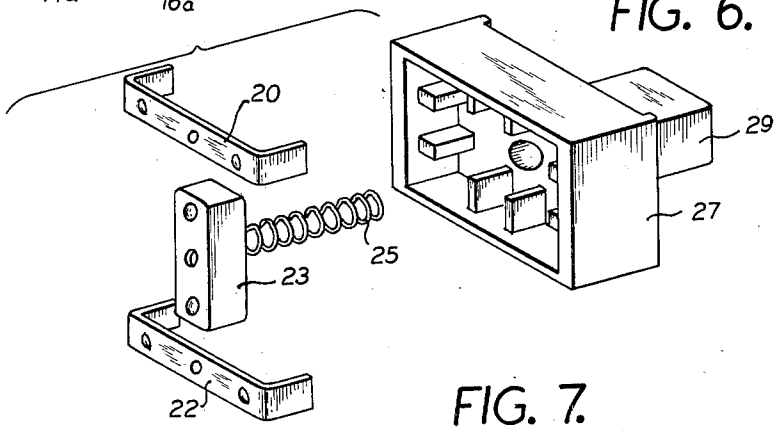
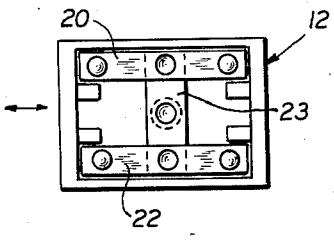


FIG. 7.



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ALTERNATE COLUMN SELECTOR FOR MULTIPLE COLUMN VENDING MACHINES

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5 Claims. (Cl. 221—116)

This invention relates to coin-actuated vending machines of the type used in vending cigarettes, cigars, candies and many other commodities and articles of merchandise. For purposes of illustration, however, the invention will herein be described and shown solely in relation to a cigarette vending machine, but this should not be understood as limiting the invention in any respect whatsoever.

With the advent of an increasing number of cigarette brands, a modern cigarette vending machine must be capable of handling many different brands of cigarettes. For example, a typical cigarette vending machine in common use today dispenses at least twenty different brands. This does not mean that the machine is provided with only twenty columns for these twenty brands of cigarettes. Instead, it may be provided with thirty individual columns and thirty selector buttons, one for each column. These figures are purely illustrative.

Because certain brands are preferred over others, it may be found necessary to load a multiple number of columns for the more popular brands. Thus, in a thirty-column cigarette vending machine perhaps twenty or twenty-four different brands of cigarettes may be stocked and dispensed. Let it be assumed, also by way of example, that of these various brands six are the most popular, and in such case it may be found desirable that each of these six popular brands be stocked in two columns, the less popular brands being stocked in single columns. Thus, of the twenty-four brands in a typical thirty-column cigarette vending machine, eighteen would occupy one column apiece and six would each occupy two columns.

As has above been indicated, each column is provided with a separate selector button. Regardless of the configuration or special arrangement in which the selector buttons are located on the face of the machine, certain buttons will be more actively used than others, for a variety of psychological reasons. Thus, it will be found that in loading a multiplicity of columns with the same brand the selector button related to one of these columns will be more actively utilized by purchasers than the selector buttons relating to the other columns in the same group, and consequently the more active button will more quickly deplete the contents of the column with which it is associated.

It is the principal object of this invention to provide means for coupling a plurality of columns and alternating selector means for alternating the dispensing operations of said columns.

By way of illustration, assuming that two columns containing a single brand of cigarettes are coupled by the means herein provided, these columns will alternately dispense their contents irrespective of which of their individual selector buttons is actuated. More specifically, let the coupled columns be designated columns A and B, and let their respective selector buttons be desiganted buttons A and B. When the alternating selector means is brought into operation, button A may be actuated to dispense cigarette packages from column A. Should the next purchaser actuate either button A or button B, a cigarette package will be dispensed from column B. The third purchaser may actuate either of the two buttons, and his cigarette package will be dispensed from column A. Thus, the coupled columns

alternately dispense their contents irrespective of which of their individual selector buttons is actuated.

The foregoing procedure is complicated, however, by the fact that successive purchasers do not always buy the same brand. For example, the first and second purchasers may buy brand X, the third may buy brand Y, the fourth may buy brand Z, and so on. Some of the brands may be in coupled columns, and others may not. The invention accordingly provides alternating means linked to all of the coupled columns, and applying to all of them simultaneously the alternating procedure above described, irrespective of which selector button is actuated.

The elements of a vending machine capable of incorporating this alternate selector means are a series of selector switches and a series of associated solenoid or motorized selector members. The alternate selector means herein provided may easily be locked out of operation or brought into operation, as desired. When it is placed in an inoperative position, the selector switches are connected directly to their respective actuating solenoids or other mechanisms. When the alternate selector means is placed in an operative position, the selector buttons are connected to each other in parallel, and the output from either of them is fed to the common pole of a single-pole, double-throw switch. The remaining terminals of the double-throw switch are then connected to the actuating solenoids. In operation, the double-throw switch (which may be called an alternating switch) is changed in its position during each cycle of the vending machine and held in that position until the next cycle. This mode of operation creates a situation wherein the commonly joined selector switches are alternately led to the actuating solenoids of the coupled columns of merchandise.

In this system the actuation of the dispensing means connected with any merchandise column in the machine will cause the alternating switch to change its position. Thus it is possible to obtain merchandise from the same column twice in succession if another actuating solenoid is energized between the two vending cycles. The delivery of merchandise is therefore not completely alternating in character. The degree or extent to which the system will function perfectly (that is, the merchandise in coupled columns will be delivered in equal quantities) will follow the theoretical random distribution curve.

The advantage of this system lies in the fact that a great number of selector switches and their respective actuating solenoids can be coupled without requiring a separate alternating mechanism for each group of coupled selector switches. The very action of the machine itself creates the alternating effect, and a simple drive mechanism which is actuated on every purchase from the machine can be incorporated into the system.

More precisely, the present invention consists of a series of single-pole, double-throw alternator switches, which on repeated cycles of the vending machine are alternately depressed and released. The means for actuating these switches in the above mentioned alternating manner is coupled only to the drive mechanism of the machine, and not to the selection system. There is provided an integral means for by-passing these switches in those cases where it is not desired to couple columns and selector switches. There is one alternating switch for each pair of selector switches and column-actuating solenoids. In addition there is one double-pole, double-throw switch for each pair for the purpose of by-passing the actuating switch and providing for normal single operation of each column of merchandise.

The basic invention utilizes a single-pole, double-throw

switch which is alternatingly actuated, an actuating means for this switch which functions on each cycle of the machine, and a manually operated double-pole, double-throw switch for the purpose of introducing the alternator switch into the circuit or bypassing the alternator switch as required by the operator of the equipment. If desired, the invention may provide for alternation only upon actuation of the columns coupled.

The apparatus illustrated in the drawing is designed to couple the columns in pairs, but it is also possible to arrange for the coupling of three or more columns, utilizing the same principles of the invention.

The invention is illustrated in the accompanying drawing in which:

FIG. 1 is a plan view of an alternate column selector made in accordance with the principles of this invention.

FIG. 2 is an end view thereof.

FIG. 3 is an enlarged cross section on the line 3—3 of FIG. 1.

FIG. 4 is a similar but fragmentary view showing the alternator switch in another position.

FIG. 5 is a fragmentary plan view of a printed circuit which the present invention utilizes, also showing schematically the switch elements thereof,

FIG. 6 is an enlarged, perspective, exploded view of one of the selector switches.

FIG. 7 is a bottom view thereof.

Referring in the first instance to FIG. 5 of the drawing, it will be seen that the invention requires two switches for each pair of merchandise columns, this being in addition to the conventional individual selector switch with which each column is provided. In a typical case, each column is provided with an electrically actuated dispensing mechanism, usually operated by a solenoid **11**. The selector switch **13** is operated by the purchaser to energize the solenoid, and when said selector switch is released, the solenoid is deenergized.

The two switches which the invention requires are an alternating switch **10** and a manually operated control switch **12**. The alternating switch **10** is preferably a single-pole, double-throw switch which is alternatingly actuated by drive means shortly to be described. FIG. 5 shows six alternating switches **10** for coupling six pairs of merchandise columns. The manually operated switch **12** is preferably a double-pole, double-throw switch as illustrated in FIGS. 6 and 7. It is provided with a pair of contact bars **20** and **22** which float in shell **27**. A pressure block **23**, downwardly urged by spring **25**, bears against the two contact bars. A knob **29** on shell **27** serves as a finger grip for actuating the switch.

Alternate solenoids **11** are connected to printed conductors **14** and the remaining solenoids are connected to conductors **16**. Printed conductors **14***a* which relate to conductors **14** and printed conductors **16***a* which relate to conductors **16** are respectively in circuit with selector switch **13**. It will be noted that in the illustrated form of the invention switches **13** are of the push button type but any other suitable selector switch means may be employed.

When it is desired to operate each column individually, the manual switch **12** is moved to its **12***a* position. In this position, contact bar **20** connects conductors **14** and **14***a* and contact bar **22** connects conductors **16** and **16***a*. When a selector switch **13** is actuated, the individual column to which it relates will dispense its merchandise. This is conventional.

On the other hand, when it is desired to couple a pair of adjoining columns and to alternate their dispensing operations, the manual switch which pertains to said columns, is moved to its position indicated by the reference numeral **12** in FIG. 5. The two conductors **14***a* and **16***a* will now be connected to a T-shaped intermediate conductor **24**, the head or cross bar thereof being situated between conductors **14** and **16** on the one hand, and conductors **14***a* and **16***a* on the other hand. The stem of said T-shaped conductor **24** is disposed between conductors **14** and **16**.

It will now be seen that each alternating switch **10** is connected to one of said T-shaped conductors **24**. The contact arm of each said alternating switch alternates between the adjacent conductors **14** and **16**. When it is connected to conductor **14**, both conductors **14***a* and **16***a* are brought into circuit with said conductor **14**. Hence when the selector switch of either conductor **14***a* or **16***a* is actuated by a customer, only the solenoid which is connected to said conductor **14** will be energized, and therefore only the individual merchandise column which is related to it will dispense its contents. On the other hand, when the contact arm of said alternating switch is connected to conductor **16**, both conductors **14***a* and **16***a* will be in circuit with said conductor **16**. Hence either of the selector switches related to said conductors **14***a* and **16***a* will energize the solenoid connected to conductor **16** and the individual merchandise column connected therewith will dispense its contents. As the contact arm alternates between the two conductors **14** and **16**, so will the two merchandise columns alternate in their dispensing operations. What remains is a discussion of the alternating mechanism which actuates the alternating switch.

Referring now to the first four figures of the drawing, it will be observed that a pair of frame members **30** and **32** are provided at the opposite ends of supporting base **34** on which the printed circuit shown in FIG. 5 is formed. A bar **36** extends the length of said supporting base and the ends of said bar are provided with bearings **38** and **40** which are journaled into said frame members **30** and **32**. This permits bar **36** to engage in angular movement about its longitudinal axis.

Bearing **38** is shown to be secured to a drive wheel **50** which is provided with a plurality of pins **52**. In the illustrated form of the invention, there are four such pins situated at equal distances from the center of the drive wheel and equidistant from each other. A drive member **56** which is connected to the drive mechanism of the machine engages these pins seriatim and causes the drive wheel to rotate in 90 degree increments in the direction of curved arrow **54** in FIG. 2. In other words, drive wheel **50** is caused to make a quarter revolution each time one of its pins **52** is driven by said drive mechanism.

To insure registration of said drive wheel in its four angular positions, indexing or stop pawl **60** is provided. This pawl is pivoted on a pivot pin **62** which is secured to frame member **30**. A spring **64** between said frame member and the lower end of said pawl biases the pawl in clockwise direction about pin **62** as viewed in FIG. 2. A notch **66** at the upper end of the pawl receives and engages each of the pins **52**, one at a time. This results in precise positioning of the drive wheel in all four angular positions.

Bar **36** is the actuating means for alternating the operation of switch **10**. As drive wheel moves into its four angular positions so does bar **36**, the first position of said bar being shown in FIG. 3, the second being shown in FIG. 4, the third being 180 degrees removed from the FIG. 3 position, and the fourth being 180 degrees removed from the FIG. 4 position. In its first and third position bar **36** engages lever **70** pivoted on bracket **72**. A spring **74** interconnects said lever with contact arm **76** of alternating switch **10**. Said contact arm **76** is thereby biased onto engagement with fixed contact member **78**. When bar **36** is moved into its second and fourth positions, lever **70** is disengaged (as shown in FIG. 4) and contact arm **76** is spring urged into engagement with fixed contact member **80**. These fixed contact members are connected to the printed conductors **14** and **16** shown in FIG. 5 and in this manner the alternating switch alternately makes and breaks the circuit between intermediate conductor **24** and the two printed conductors **14** and **16**.

Each operating cycle of the vending machine will cause a 90 degree angular movement of the drive wheel **50** and

actuating bar 36 and either engagement or disengagement by said bar of lever 70. The alternating switch 10 will accordingly operate first in one direction and then in the other to alternate in making and breaking the circuit between said conductors 14 and 16 and said intermediate or by-pass conductor 24. This will have the effect of coupling a pair of merchandise columns and alternating the operation of their respective dispensing mechanisms. To uncouple these columns and to resume the individual operation of their dispensing mechanisms, all that need be done is to move switch 12 to its 12*a* position. Conductors 14 and 14*a* will now be connected as will conductors 16 and 16*a* and intermediate conductor 24 with its alternating switch 10 will be by-passed.

The foregoing is illustrative of the principles of the invention and it will be understood that the physical apparatus and components shown in the drawing may be varied and modified in accordance with the requirements of individual installations.

I claim:

1. In a vending machine of the character described having a drive mechanism, the combination of a plurality of electrically operated dispensing mechanisms, an individual circuit connected to each said dispensing mechanism, a manually operated switch controlling each said individual circuit, means for interrupting said individual circuits and by-passing the interruptions through a common by-pass circuit, an alternating switch interconnecting said by-pass circuit with said individual circuits to alternately operate said dispensing mechanisms upon actuation of said manually operated switches, and drive means for automatically operating the alternating switch, said drive means being adapted to be connected to the drive mechanism of the vending machine.

2. In a vending machine of the character described, having a drive mechanism, the combination of a plurality of electrically operated dispensing mechanisms, an individual circuit connected to each said dispensing mechanism, a manually operated switch controlling each said individual circuit, means for interrupting said individual circuits and by-passing the interruptions through a common by-pass circuit, an alternating switch interconnecting said by-pass circuit with said individual circuits to alternately operate said dispensing mechanisms upon actuation of said manually operated switches, and drive means for automatically operating the alternating switch, said drive means being adapted to be connected to the drive mechanism of the vending machine, the means for interrupting the individual circuits and by-passing the interruptions comprising a double-pole, double-throw switch.

3. In a vending machine of the character described, having a drive mechanism, the combination of a plurality of electrically operated dispensing mechanisms, an individual circuit connected to each said dispensing mechanism, a manually operated switch controlling each said individual circuit, means for interrupting pairs of said individual circuits and by-passing the interruptions through a common by-pass circuit, an alternating switch interconnecting said by-pass circuit with said individual circuits to alternately operate said dispensing mechanisms upon actuation of said manually operated switches, and drive means for automatically operating the alternating switch, said drive means being adapted to be connected to the drive mechanism of the vending machine, the means for interrupting the individual circuits and by-passing the interruptions comprising a double-pole, double-throw switch, said alternating switch comprising a single-pole, double-throw switch.

4. In a vending machine of the character described, having a drive mechanism and a plurality of merchandise storing columns, the combination of an electrically operated dispensing mechanism for each column, a selector switch in circuit therewith, switch means for breaking the circuit between the selector switches and electrical dispensing mechanisms of a selected group of merchandise storing columns and connecting said selector switches to a common by-pass circuit, an alternating switch which alternately connects said common by-pass circuit to said electrical dispensing mechanisms, and drive means for automatically operating the alternating switch, said drive means being adapted to be connected to the drive mechanism of the vending machine.

5. In a vending machine of the character described, having a drive mechanism and a plurality of merchandise storing columns, the combination of electrically operated dispensing mechanisms for said columns, individual selector circuits connected to said dispensing mechanisms, a common by-pass circuit, a double-pole, double-throw switch connected into said selector circuits to interrupt them and connect them to said by-pass circuit, a single-pole, double-throw alternating switch adapted to alternately connect said by-pass circuit to said dispensing mechanisms, and drive means for automatically operating the alternating switch, said drive means being adapted to be connected to the drive mechanism of the vending machine.

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