

[54] **COLUMN SWITCHING PIVOTED SHELF MERCHANDISING MACHINE**

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[58] Field of Search **221/6, 17, 90, 110**

[56] **References Cited**

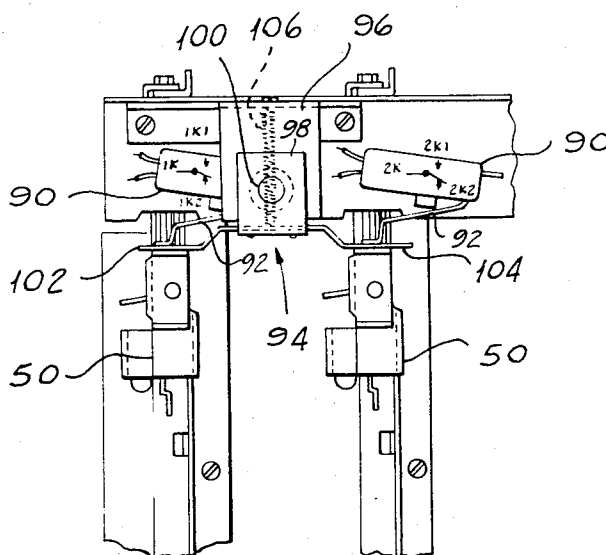
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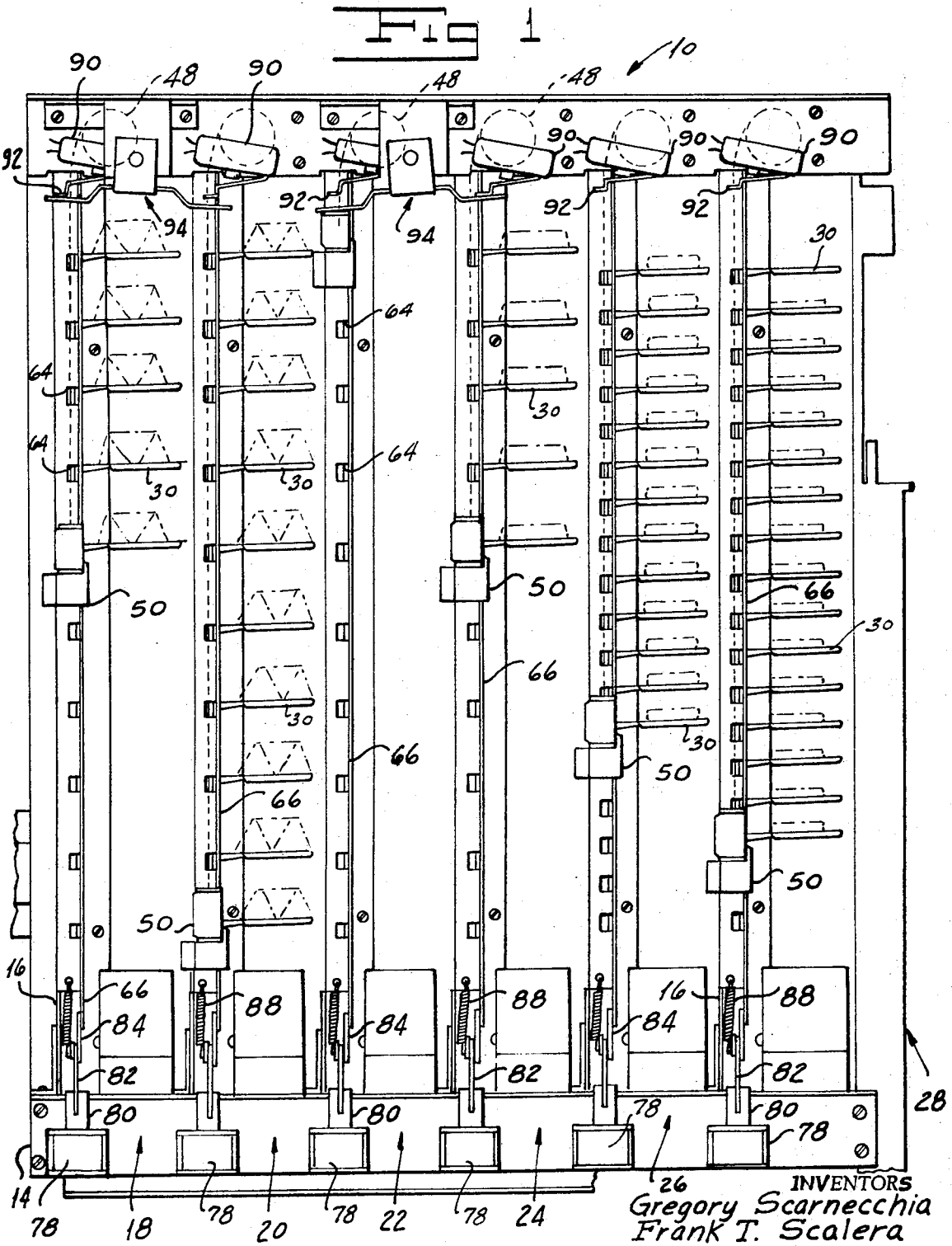
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[57] **ABSTRACT**

A column-switching, pivoted-shelf merchandising machine of the type in which respective travellers associated with columns of normally erected pivoted shelves sequentially release the shelves as they move upwardly in response to operation of their associated actuating mechanisms. We provide means for initially disabling one of the mechanisms and for enabling the other mechanism in response to actuation of a common push button or the like. This means is responsive to arrival of the one traveller at the top of its column for concomitantly disabling the one mechanism and enabling the other mechanism and responsive to the presence of both travellers at the top of the columns for disabling both mechanisms and for giving an empty signal.

12 Claims, 7 Drawing Figures





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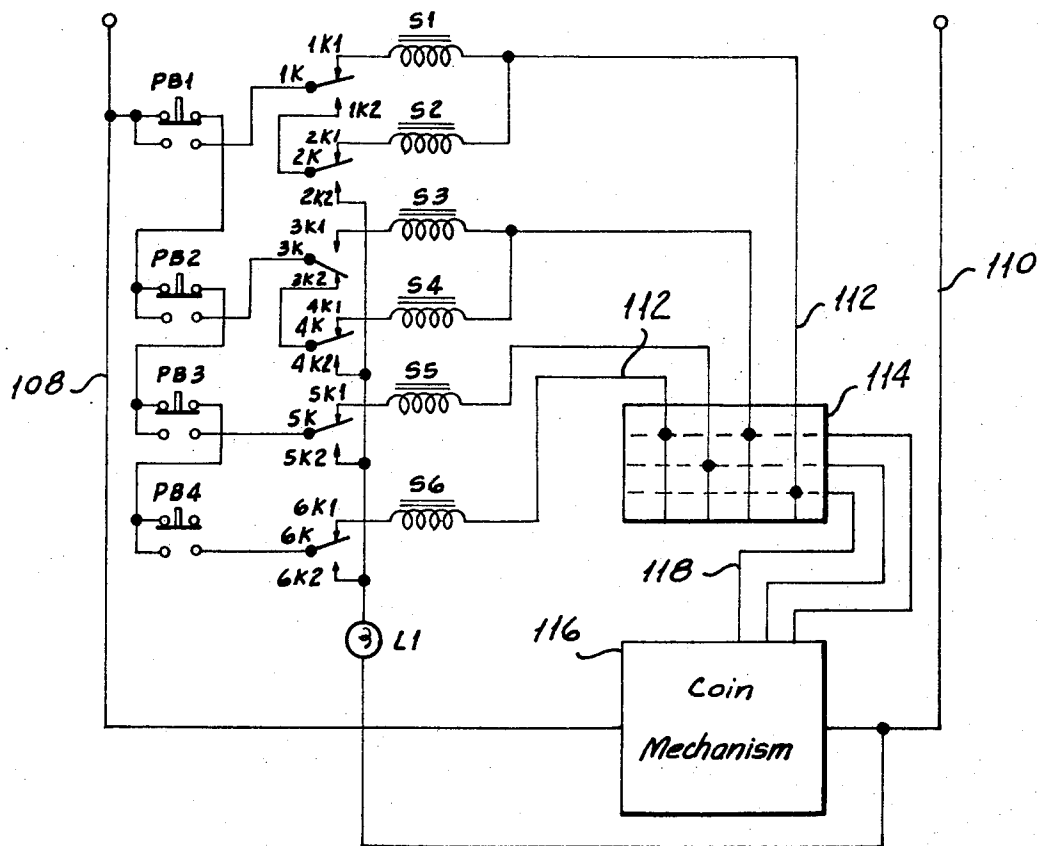


Fig 7

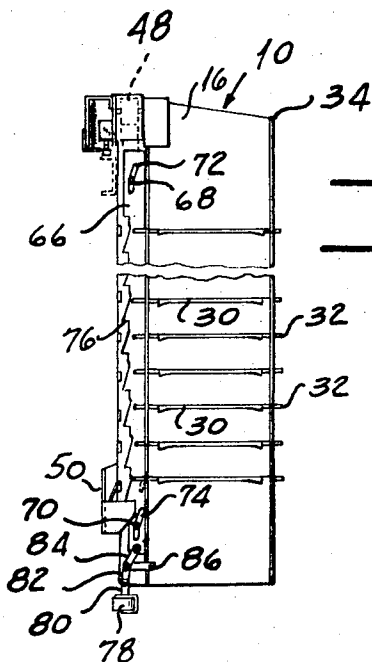
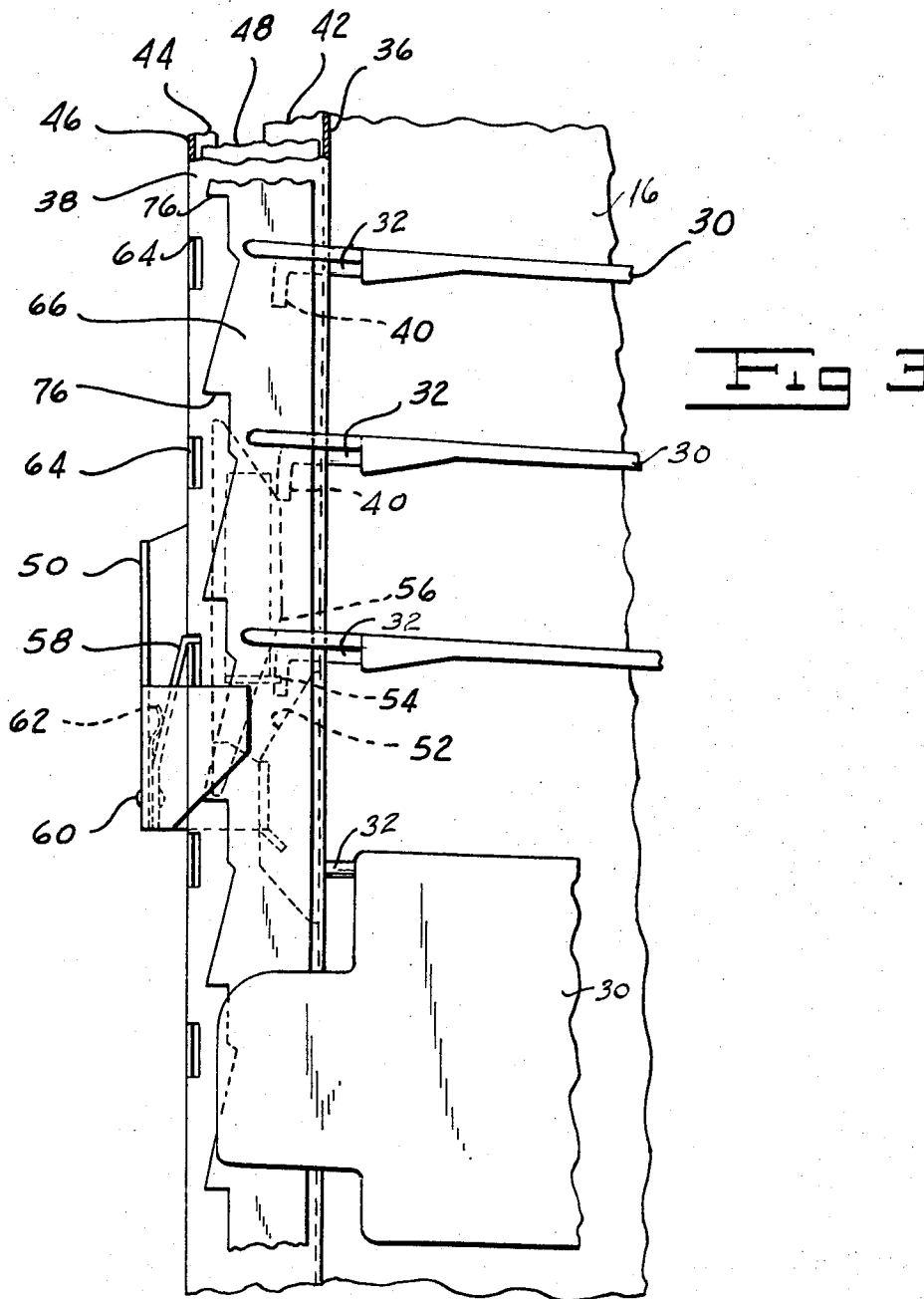
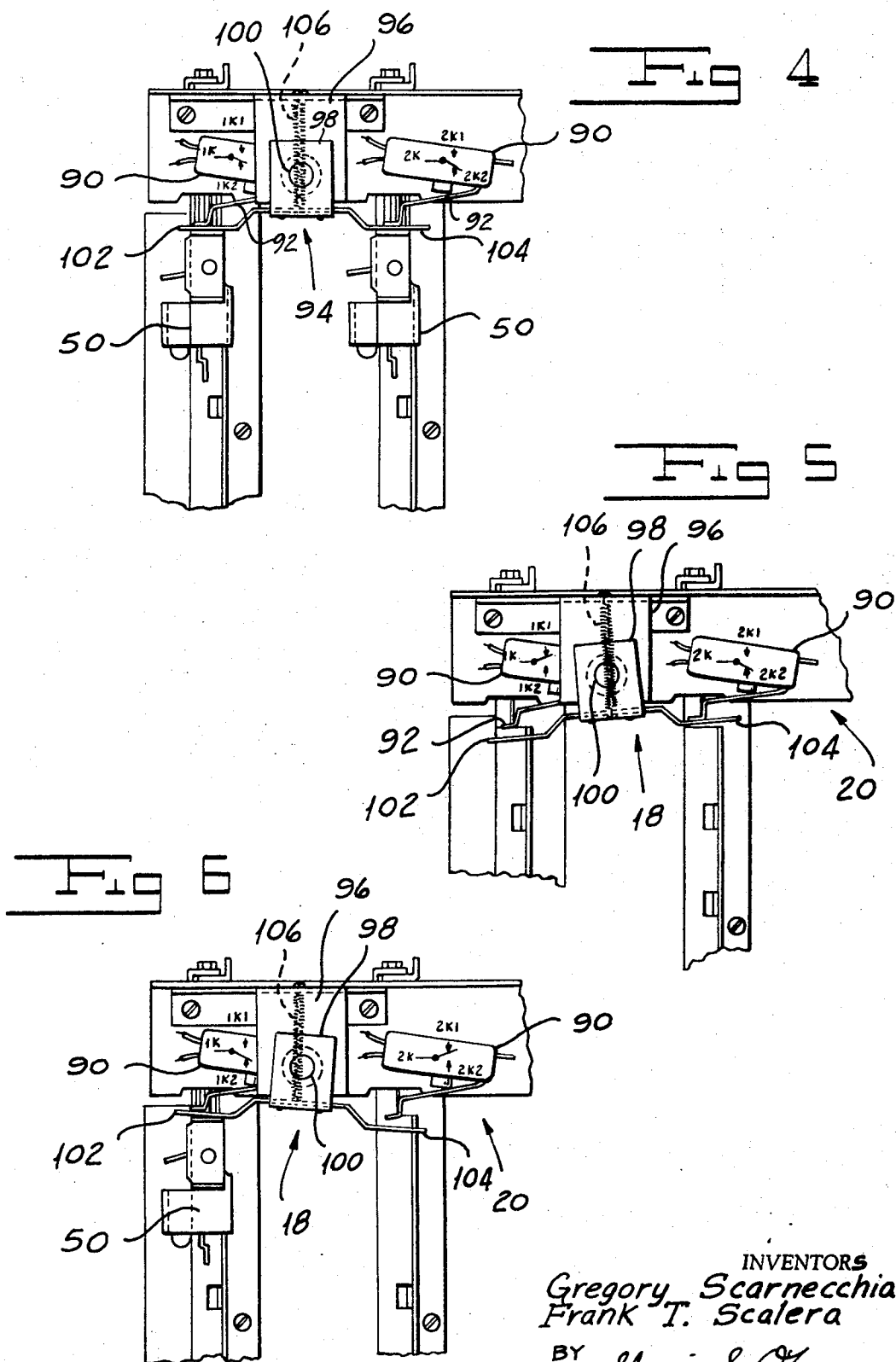


Fig 2

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COLUMN SWITCHING PIVOTED SHELF MERCHANDISING MACHINE

This application is a continuation of Ser. No. 841,514, filed July 14, 1969, now abandoned.

BACKGROUND OF THE INVENTION

There are known in the prior art merchandising machines in which columns of normally erected pivoted shelves support articles of merchandise. One machine of this type is described in U.S. Pat. No. 2,996,217 issued Aug. 15, 1961 to Gabrielson et al. In the machine shown in that patent a traveller initially located adjacent the bottom of a column of shelves supporting articles of merchandise moves upwardly in steps in response to actuation of an operating mechanism sequentially to release the shelves to deliver the articles of merchandise to the customer. Further, in machines of the type shown in the patent referred to above, a plurality of columns are provided with an independent operating mechanism for each and with a common coin mechanism for freeing the operating mechanisms in response to the deposit of coins.

Machines of the type described above are adapted to dispense a variety of articles of merchandise in the respective columns. It has been found, however, in practice that certain items sell much faster than do others. For that reason, the usual practice in merchandising machines of the type described is to provide two columns or more of each of the faster-selling articles of merchandise. While this expedient permits the supplies of various articles to be depleted at substantially the same rate, it has a number of drawbacks. First, a completely independent operating mechanism is provided for two or more columns which sell the same articles of merchandise. It is thus relatively expensive for the result achieved. This expedient, moreover, does not ensure even partial first-in first-out operation. It is relatively inconvenient for the customer, since he must first observe that one of the columns is out of merchandise before he actuates the operating mechanism of the other column.

We have invented a column-switching, pivoted shelf merchandising machine which is an improvement over pivoted shelf merchandising machines of the type known in the prior art. Our machine eliminates duplication of actuating mechanisms for fast-selling articles. It ensures at least partial first-in first-out operation of the machine for fast-selling articles. It is essentially adapted for use in merchandising a variety of articles, some of which are faster sellers than are others. It is convenient for the customer to use. It is simple in construction and is inexpensive to manufacture for the result achieved thereby. It permits existing machines to be modified in a simple and expeditious manner.

SUMMARY OF THE INVENTION

One object of our invention is to provide a column-switching, pivoted shelf merchandising machine which is an improvement over pivoted shelf merchandising machines of the type known in the prior art.

Another object of our invention is to provide a column-switching, pivoted shelf merchandising machine which is especially adapted to dispense a variety of articles some of which are faster sellers than others.

A further object of our invention is to provide a column-switching, pivoted-shelf merchandising machine which provides at least partial first-in first-out operation for fast-selling articles.

A still further object of our invention is to provide a column-switching, pivoted shelf merchandising machine which is simple and inexpensive to construct.

Yet another object of our invention is to provide a column-switching, pivoted shelf merchandising machine the arrangement of which is adaptable to existing pivoted shelf merchandising machines.

Other and further objects of our invention will appear in the following description.

In general our invention contemplates the provision of a column-switching, pivoted-shelf merchandising machine in which respective travellers associated with columns of normally erected pivoted shelves move in steps in response to operating mechanisms having a common actuating element sequentially to release the shelves of the columns to deliver articles of merchandise from an initial position in which only one of the operating mechanisms is enabled. The other mechanism is automatically enabled in response to arrival of the first traveller at the limit of its movement. When both travellers arrive at the limits of their movement when the supplies in both columns are exhausted a signal is given to indicate that articles are sold out.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

FIG. 1 is a front elevation of our column-switching, pivoted shelf merchandising machine.

FIG. 2 is a side elevation of the form of our column-switching, pivoted shelf merchandising machine illustrated in FIG. 1.

FIG. 3 is a fragmentary side elevation of our column-switching, pivoted-shelf merchandising machine illustrating the details of the operating mechanism thereof.

FIG. 4 is a fragmentary front elevation of our column-switching, pivoted shelf merchandising machine illustrating the condition of the column-switching mechanism when both columns are empty.

FIG. 5 is a fragmentary front elevation of our column-switching, pivoted shelf merchandising machine illustrating the condition of the column-switching mechanism with the operating mechanism of one of the columns enabled.

FIG. 6 is a fragmentary front elevation of our column-switching, pivoted shelf merchandising machine illustrating the condition of the column-switching mechanism with the operating mechanism of the other column enabled.

FIG. 7 is a schematic view of one form of electrical circuit which may be used to control our column-switching, pivoted shelf merchandising machine.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, our column-switching pivoted shelf merchandising machine, indicated generally by the reference character 10, includes frame brackets 12 and 14 which support a plurality of panels 16 which divide the machine into a number of respective columns, indicated generally by the reference characters 18, 20, 22, 24, 26 and 28 of shelves 30 having shafts 32 by means of which the shelves are supported for pivotal and for limited lateral movement. Each shaft 32 extends through an offset 34 at the back of its associated panel 16 and through one wall 36 of a channel 38 secured to the forward edge of the panel 16 by any suitable means such as by welding or the like.

We provide each shelf 30 with a releasing wire or hook 40 normally disposed to the right of a portion 42 of the panel 16 extending into the channel 38 so as to hold the shelf erect. In a manner to be described, the hooks 40 are sequentially moved to the left together with their associated shelves to positions at which the hooks 40 are located in the space between the edge of panel portion 42 and the edge of a flange 44 on the other wall 46 of the channel so that the shelves can be released to permit articles to fall to a delivery area (not shown) at which they are accessible to the customer.

Negative springs 48 mounted at the tops of the respective columns normally urge travellers 50 upwardly. Each traveller 50 comprises a releasing cam 52 adapted sequentially to move the hooks 40 in the manner described above sequentially to release the shelves as the traveller moves upwardly. Traveller 50 also includes a horizontal cam 54 adapted to engage the

released wires 40 when the traveller is pulled downwardly to re-erect the shelves and a reset cam 56 which shifts the re-erected shelves to positions at which their associated hooks 40 lie behind the panel portion 42 when the column is reloaded in a manner to be described.

Traveller 50 loosely carries a pawl 58 on a pin 60. A spring 62 supported on pin 60 normally biases the pawl 58 toward the wall 46 of channel 38. In the rest or inactive positions of the parts the pawl 58 engages the upper edge of one of a plurality of notches 64 formed in the wall 46.

Each column of our machine includes a traveller releasing bar 66 supported for vertical and lateral movement by respective pins 68 and 70 disposed in slots 72 and 74 in the bar 66. In a manner to be described, when the mechanism of its column is operated bar 66 is moved downwardly and to the left as viewed in FIG. 3 and then is returned to the normal position shown in the drawings. As the bar moves downwardly and to the left one of a number of noses 76 on the bar 66 picks up the pawl 58 and moves it out of the notch 64. When the bar returns the pawl 58 engages wall 46 and the traveller 50 moves upwardly under the influence of spring 48 until it rides into the next notch 64. In the course of this movement cam 52 engages the hook 40 of the next uppermost of the shelves 30 to shift the shelf to the left until the hook 40 can fall into the space between panel portion 42 and flange 44 to release the shelf. The construction and operation of the bar 66 and the traveller mechanism 50 is more fully described in the Gabrielson et al. patent referred to hereinabove.

The operating mechanism for the respective bars 66 of our machine comprises a plurality of solenoids 78 associated with the respective columns. Each solenoid has an armature 80 connected by a link 82 to a second link 84 secured to the associated bar 66. An arm 86 pivotally supported on the corresponding panel 16 is connected to the pivot between links 82 and 84 to control the movement of the linkage. A spring 88 connected to the channel 38 and to the pivotal connection between links 82 and 84 normally urges the parts to the positions shown in FIG. 2. When the solenoid is energized in a manner to be described the linkage 82, 84 moves bar 66 downwardly to cause it to release pawl 58 of its associated traveller 50 to cause the traveller to move upwardly through the distance between successive notches 64.

As the traveller 50 of a particular column moves upwardly it sequentially releases the shelves 30 of the column until it reaches an upper limit position at which the supply of articles in the associated column is exhausted.

As has been pointed out hereinabove, our machine is especially adapted to dispense a variety of articles some of which are faster sellers than others. By way of example, let us assume that the form of our machine shown in the drawings is to sell two relatively fast-moving articles and two articles which do not sell as quickly. In such an instance, we load columns 18 and 20 with one of the faster selling articles, columns 22 and 24 with the other fast-selling article and columns 26 and 28 with the respective slower selling articles.

We mount a respective switch 90 having an actuating arm 92 adjacent the top of each of the columns of our machine. At the extreme limit of upward movement of any of the travellers 50 it will normally operate the associated switch arm 92. In our arrangement we provide a mechanism indicated generally by the reference character 94 for disabling one of the solenoids 78 of the columns 18 and 20 through the medium of the associated switch 90 after the machine is loaded. The disabled solenoid is re-enabled when the traveller 50 associated with the enabled solenoid 78 reaches the upper limit of its movement and both solenoids are disabled when the second traveller 50 reaches the limit of its upward movement. We provide the same arrangement for the pair of columns 22 and 24.

Referring to FIG. 4 we have shown the condition of the travellers 50 the switches 90 and the mechanism 94 of columns 18 and 20 when the supplies of articles in both columns have been exhausted and the machine is ready for loading. Each of the mechanisms 94 includes a main support

bracket 96 secured to the bracket 12 by any suitable means such as by rivets or the like. We mount a flip flop bracket 98 for rotatable movement on a stud 100 carried by the bracket 96. Any suitable means such as rivets or the like secure resilient arms 102 and 104 formed from a piece of unitary spring material to the base of bracket 98. We connect a toggle spring 106 between the bracket 96 and the center of the base of bracket 98 so that the axis of the spring normally passes through the axis of the stud 100. In this condition of the parts the arms 102 and 104 engage the respective actuating arms 92 of the switches 90 associated with columns 18 and 20.

As will be more fully apparent from the description given hereinafter from the conditions of the parts shown in FIG. 4 both columns 18 and 20 can be conditioned for loading by pulling the travellers 50 down to their lower limits to erect the shelves of the two columns to positions at which they can support articles of merchandise loaded thereon. Depending upon which of the travellers 50 associated with the respective columns 18 and 20 is first pulled downwardly the toggle bracket 98 will pivot to such position as conditions the column whose actuator was first pulled down to dispense. For example, if the actuator 50 of the column 18 first is reset the pressure of the negator spring associated with the other traveller will cause bracket 98 to rotate slightly in a counter-clockwise direction in which position shown in FIG. 5 it will be held by the action of the toggle spring 106 when the traveller 50 of column 20 is reset.

From the condition of the parts just described as the machine operates the traveller 50 of column 18 moves upwardly in steps until it arrives at the position shown in FIG. 6 whereat the traveller tilts the toggle mechanism in a clockwise position beyond dead center in which position it will be held by the toggle spring so as to disable column 18 and enable column 20 in a manner to be described. If when the machine is loaded traveller 50 of column 20 is the first to be moved downwardly or reset then dispensing will begin with column 20 and will shift to column 18 when the supply of articles of merchandise in column 20 is exhausted. When the supplies of articles in both columns are exhausted the toggle bracket 98 returns to the dead center position shown in FIG. 4 and a signal informs the customer that the supply of articles of the type dispensed in these columns is exhausted.

Referring now to FIG. 7 the control circuit of our column switching pivoted shelf merchandising machine may be supplied with power from respective conductors 108 and 110. In FIG. 7 for purposes of simplicity we have designated the solenoids associated with columns 18, 20, 22, 24, 26 and 28 as S1 to S6 respectively. Similarly, the switches 90 associated with the respective columns have been shown as having contact arms 1K to 6K adapted to engage respective pairs of contacts 1K1 and 1K2 through 6K1 and 6K2. We provide actuating elements such as respective push buttons PB1 and PB2 for the pairs of columns 18 and 20 and 22 and 24 and respective push button switches PB3 and PB4 or the like for columns 26 and 28.

Each of the push button switches PB1 to PB4 normally bridges an upper pair of contacts and is adapted to be operated to bridge a lower pair of contacts. We connect the upper pairs of contacts of the push button switches in series from line 108 through PB4 to prevent more than one push button from operating its associated solenoid at one time. The lower sets of contacts of PB1 through PB4 are respectively connected to switch arms 1K, 3K, 5K and 6K. The contacts 1K1 through 6K1 are connected respectively to one terminal of the solenoids S1 through S6. The other terminals of the solenoids are connected to price line 112 leading to a price board 114. Since solenoids S1 and S2 are associated with columns containing the same articles we connect them to the same price line 112 as we do with solenoids S3 and S4. Contacts 1K2 and 3K2 are connected to arms 2K and 4K. The respective 2K2, 4K2, 5K2 and 6K2 are connected to a conductor 116 leading to an empty signal lamp L1 connected to conductor 110. The circuit of our machine includes a coin

mechanism 116 connected between lines 108 and 110 and adapted to energize one of a number of output conductors 118 leading to the price board 114 depending on the sum in coins which has been deposited in the machine. The price lines 112 are selectively connected to conductors 118 in a manner known to the art to set the prices at which the various columns or pairs of columns are to dispense articles of merchandise.

In operation of our column switching pivoted shelf merchandising machines we will assume that both columns 18 and 20 are empty as illustrated in FIG. 4. As can be seen from the schematic indications within the blocks 90 indicating the switches under these conditions contact arm 1K engages contact 1K2 and contact arm 2K engages contact 2K2. If under these conditions an attempt is made to select an article from this pair of columns by pressing PB1 to bridge its lower set of contacts a circuit will be complete from line 108 through the lower contacts of PB1 through arm 14, contact 1K2 arm 2K and contact 2K2 through lamp L1 to conductor 110 to inform the customer that the supply of merchandise contained in the columns of that pair is exhausted.

With the columns empty, when the serviceman comes to load the machines he moves both travellers 50 to the lower limit of their movement. As has been explained hereinabove, depending upon which of the two travellers is moved downwardly first the column associated with that one will be the first from which merchandise is dispensed.

Assuming that the traveller 50 associated with the column 18 was the first to be moved downwardly toggle bracket 98 moves slightly in a counter clockwise direction to the position shown in FIG. 5 and switch arm 1K reverses to engage contact 1K1 while switch arm 2K remains in engagement with its contact 2K2. The shelves are now loaded and the machine is ready for operation.

With coins in an aggregate amount equalling the price for which articles of merchandise in columns 18 and 20 are to be sold having been deposited in the coin mechanism the customer may press PB1 to energize S1 through switch on 1K and contact 1K1 to the energized price line 112. Energization of the solenoid S1 actuates the bar 66 of column 18 to move the traveller 50 up one step to release the lowermost shelf to deliver an article of merchandise. This action continues until at the upper limit of its movement the traveller engages the arm 92 of the switch 90 associated with column 18 to move the toggle bracket 98 from the position shown in FIG. 5 to the position shown in FIG. 6. When this has been done switch arm 1K moves from contact 1K1 to contact 1K2 while switch arm 2K moves from contact 2K2 to contact 2K1. By way of example, this is the condition of the switches associated with columns 22 and 24 we have shown in FIG. 7.

Under the condition of switches 90 associated with columns 18 and 20 as shown in FIG. 6 with the correct sum in coins deposited in the machine the customer may actuate PB1 to energize solenoid 52 through arm K1 contact 1K2 arm 2K and contact 2K1 to the energized price line 112 to dispense an article of merchandise from the column 20. This operation continues until either the serviceman comes to fill the machine or until the supply of articles of merchandise in the column 20 is exhausted. Considering the second possibility first, when that occurs the switches 90 associated with columns 18 and 20 return to the conditions illustrated in FIG. 4 and empty signal lamp L1 is conditioned to be lit upon operation of PB1 when the correct price has been deposited in the machine.

If the supply of merchandise in column 20 has not been entirely depleted by the time the machine is serviced upon arrival the serviceman resets the two travellers 50. However, in this case, the bracket 98 remains in the condition it occupied before servicing so that dispensing of articles will begin with column 20. Thus it will be seen if either of the columns of a coupled pair has articles left therein, dispensing begins with that column after the machine is serviced so that at least a partial first-in first-out operation is provided.

The operation of the columns 22 and 24 is the same as that described hereinabove in connection with columns 18 and 20.

Columns 26 and 28 operate as does the individual column 18, there being no column switching provided. Thus columns 26 and 28 are intended for use for articles of merchandise which do not sell as fast as articles from columns 18 and 20. When the traveller associated with either of these columns reaches its limit of upward movement empty signal lamp L1 lights.

It is to be understood that while we have shown only a total of six columns and only two pairs of coupled columns we may provide our machine with as many columns and as many coupled columns as desired. It is moreover possible for us to tie more than two columns together.

It will be seen that we have accomplished the objects of our invention. We have provided a column switching pivoted shelf merchandising machine which is an improvement over pivoted shelf merchandising machines known in the prior art. Our machine is especially adapted for use where various articles of merchandise, some of which are faster sellers than others, are to be sold. Our machine provides partial first-in first-out operation for more popular articles. It is simple in construction and operation. The improvement is adaptable to existing machines of the first-in first-out type.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of our claims. It is further obvious that various changes may be made in details within the scope of our claims without departing from the spirit of our invention. It is, therefore, to be understood that our invention is not to be limited to the specific details shown and described.

Having thus described our invention, what we claim is:

1. In a merchandising machine, an assembly including a first column of releasable members for normally holding articles of merchandise to be dispensed, a first traveler associated with said column, means mounting said traveler for movement along the length of said column from an initial position to a terminal position, means responsive to movement of said first traveler from said initial position to said terminal position for sequentially releasing the members of said first column, first means including first actuatable means adapted to be enabled for moving said first traveler along said column in response to successive actuations of said first actuatable means, a second column of releasable members for normally holding articles of merchandise to be dispensed, a second traveler associated with said second column, means mounting said second traveler for movement along the length of said second column from an initial position to a terminal position, means responsive to movement of said second traveler from its initial position to its terminal position for sequentially releasing the members of the second column, second means including second actuatable means adapted to be enabled for moving said second traveler along the second column in response to successive actuations of said second actuatable means, means for concomitantly enabling said first actuatable means and for disabling said second actuatable means and means responsive to the arrival of said first traveler in its terminal position for operating said enabling means to disable said first actuatable means and for enabling said second actuatable means.

2. An assembly as in claim 1 including means responsive to the concomitant presence of said first and second travelers in their terminal positions for disabling said first and second actuatable means.

3. An assembly as in claim 1 including means responsive to the concomitant presence of said first and second travelers in their terminal positions for permitting signalling that the supply of said articles in said columns is exhausted.

4. An assembly as in claim 1 in which said actuatable means comprises respective first and second switches and a push button switch common to said first and second switches.

5. An assembly as in claim 1 in which said actuatable means comprises respective first and second switches having actuating arms, means mounting the switches respectively adjacent the terminal positions of said travelers, and in which said enabling means comprises means common to said switches for

concomitantly engaging one of said actuating arms and releasing the other of said arms.

6. An assembly as in claim 5 in which said common means comprises a toggle member carrying respective arms, means mounting said toggle member for movement from a central position at which its arms actuate the arms of said first and second switches to a first position at which one of the toggle arms actuates one of the switch arms while the other toggle arm releases the other switch arm and a second position at which the one toggle arm releases the one switch arm and the other toggle arm actuates the other switch arm.

7. An assembly as in claim 6 in which concomitant presence of said first traveler in its terminal position and absence of said second traveler from its terminal position constrains said toggle member to its first position.

8. An assembly as in claim 6 in which concomitant presence of both of said travelers in their terminal positions constrains said toggle member to its neutral position.

9. An assembly as in claim 6 including empty signal means adapted to be enabled and means responsive to said switches in the neutral position of said toggle member for enabling said empty signal means.

10. In a merchandising machine, an assembly including in combination, a first machine section for holding a first plurality of articles of merchandise, a second machine section for holding a second plurality of articles of merchandise, respective switches associated with said sections, each of said switches having a normal position and an actuated position,

means including one of said switches in its actuated position for dispensing articles from said first section, means including the other switch in its actuated position for dispensing articles from said second section, an actuating element common to said switches, means mounting said actuating element for movement to a first position at which said one switch is in its actuated position and said other switch is in its normal position and to a second position at which said one switch is in its normal position and said other switch is in its actuated position, means initially positioning said common actuating element in its first position, and means responsive to the dispensing of the last article in said first section for moving said common actuating element to its second position.

11. An assembly as in claim 10 in which said mounting means mounts said common actuating element for movement to a neutral position at which both said switches occupy their normal positions, an empty signal, means including said switches in their normal positions for energizing said empty signal, and means responsive to dispensing of the last article in said second section for moving said common element to its neutral position.

12. An assembly as in claim 11 in which said common actuating element comprises oppositely extending arms, said mounting means comprising means mounting said element for pivotal movement between limit positions corresponding to said first and second positions and a spring for releasably holding said element in said first and second positions.

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