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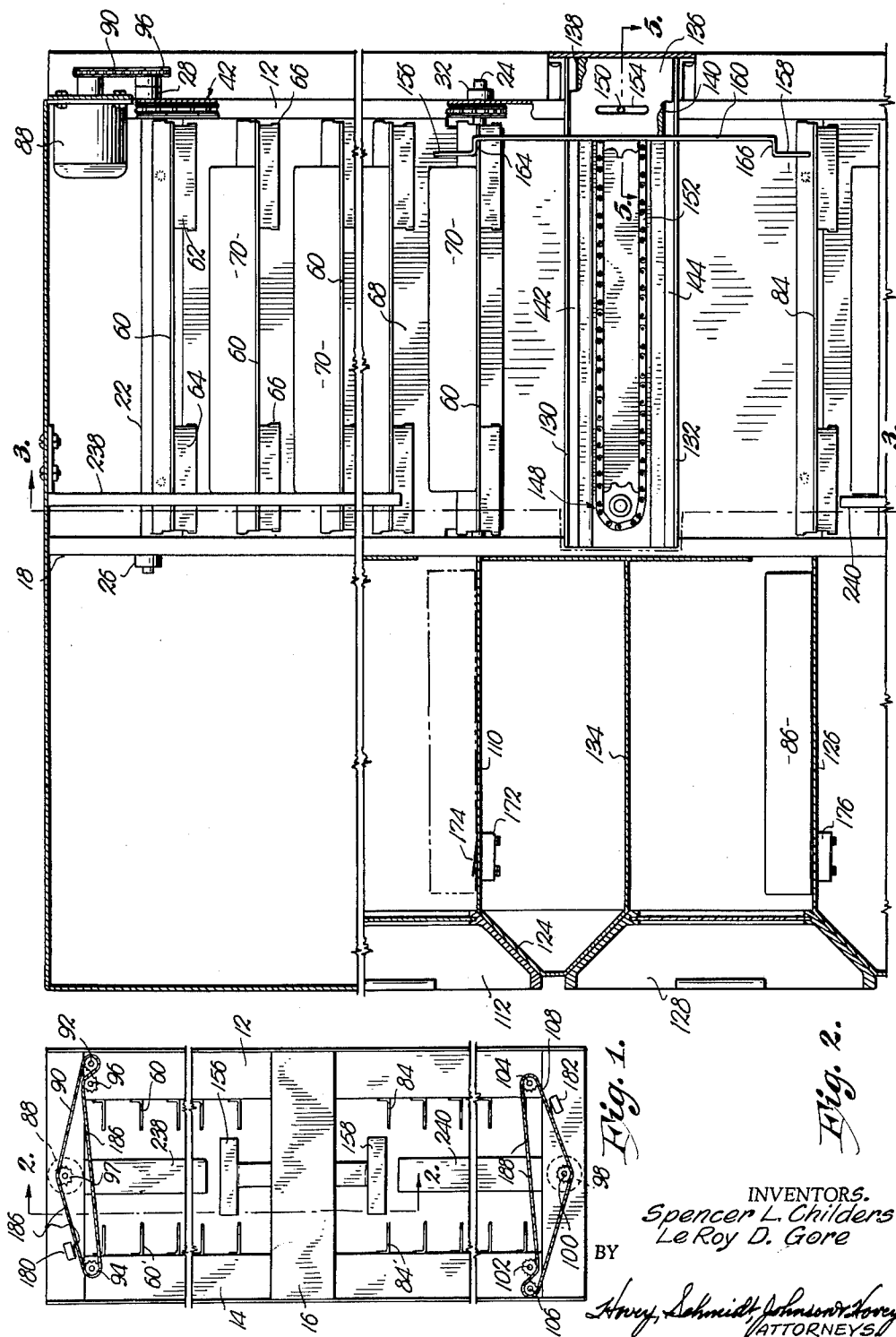
S. L. CHILDERS ET AL

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MACHINE FOR SELECTIVELY VENDING PLATTERS OR THE LIKE

Filed June 19, 1963

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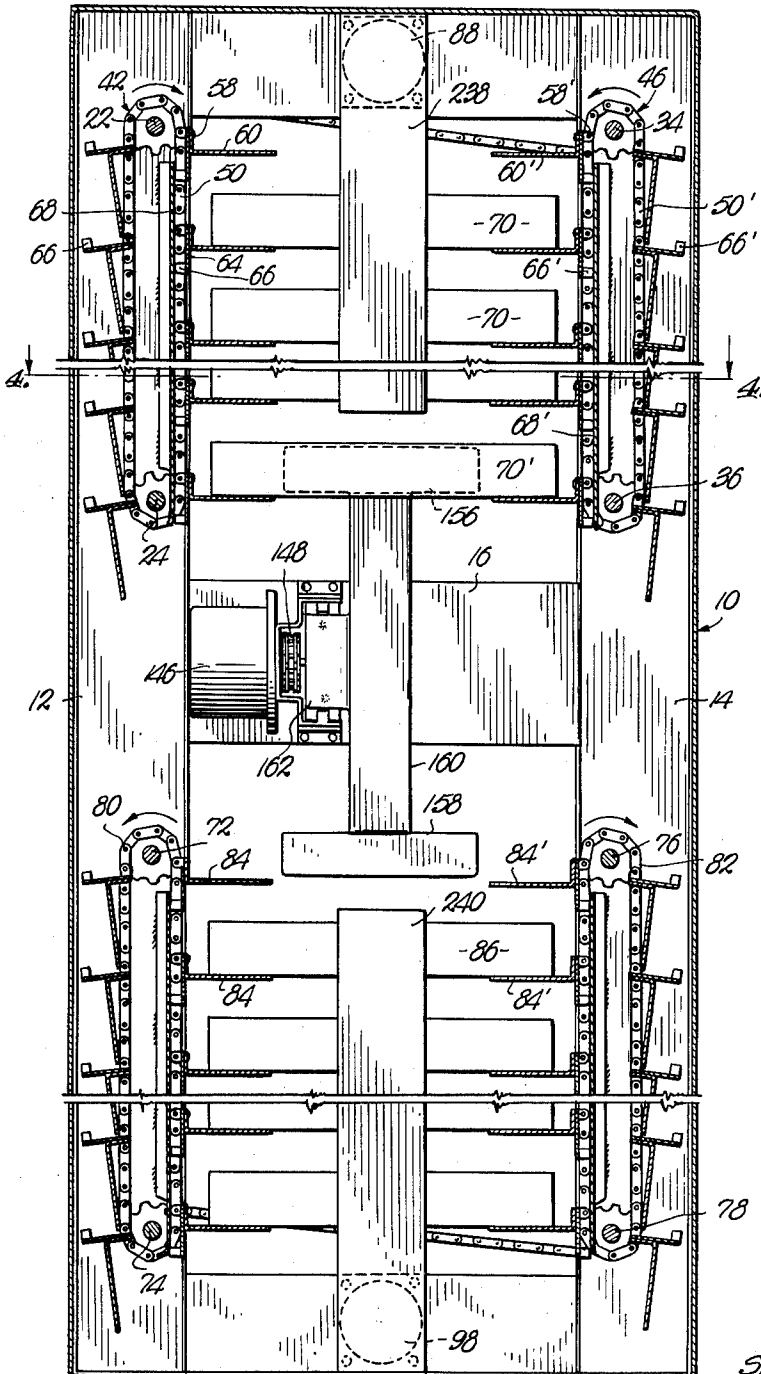


Fig. 3.

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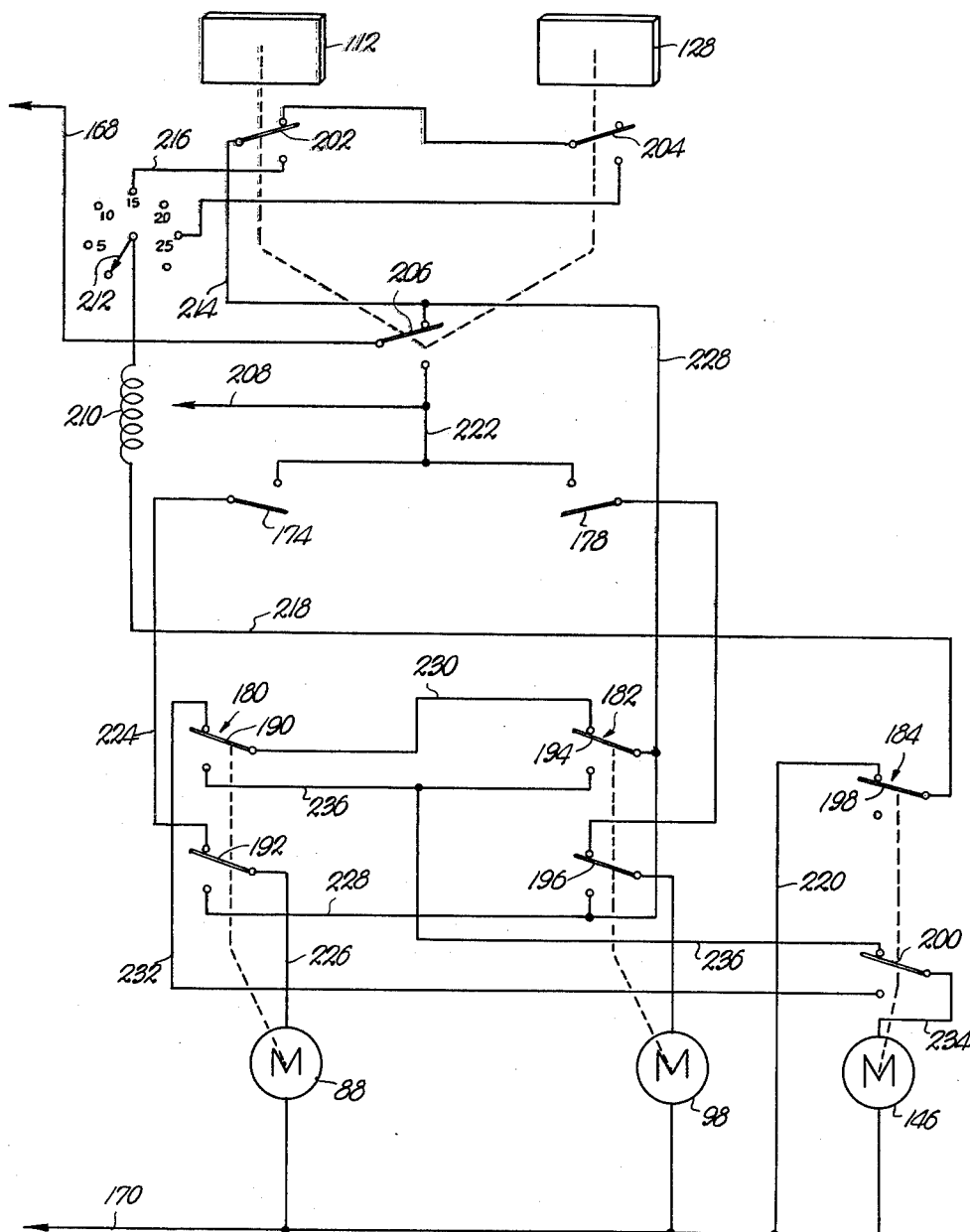


Fig. 6.

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MACHINE FOR SELECTIVELY VENDING PLATTERS OR THE LIKE

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6 Claims. (Cl. 221-13)

This invention relates generally to the automatic merchandising of foods prepared for immediate consumption and, more specifically, to coin-operated vending apparatus especially suited for vending such foods.

The automatic merchandising of foods prepared for immediate consumption was initially limited to the vending of hot canned foods. Although this merchandising technique was not unsatisfactory, two problems were inherent in this type of operation. First, a sanitation problem existed at the machine due to the opening of vended cans by the customer and the deposit of such cans in the vending machine area. Secondly, this type of merchandising lacked much from the aesthetic stand-point as a method of serving food in a pleasing manner to the customer.

More recently, machines have been designed to display and vend servings of meal portions in various types of plastic containers. However, most of these machines have serious limitations with respect to the size of the containers which may be accommodated, normally making it necessary to purchase several different items to obtain a complete meal.

At the present time a wide variety of full-meal platters are commercially available. These platters contain pre-cooked meals which are maintained frozen until just prior to use. Therefore, it is the primary object of this invention to provide vending apparatus capable of economically and conveniently handling the dispensing of such platters so that a customer may be served with a complete meal by a single vending operation.

It is also an object of this invention to provide automatic means for restocking the platter-receiving support within the vending machine from which a platter has been vended.

It is still another object of this invention to provide a vending machine for vending meal platters, such machine being provided with a plurality of platter-receiving supports from which the platters are vended, a conveyor operably associated with each support respectively for restocking the corresponding support after vending of a platter therefrom, and mechanism common to said supports for moving a platter off of only the restocking conveyor and onto the empty support.

It is yet another object of this invention to provide vending apparatus as set forth in the last-mentioned object wherein each of the conveyors is provided with a plurality of platter-bearing shelves, each conveyor being shiftable in increments to sequentially disposed individual, loaded shelves thereof adjacent to and in alignment with the corresponding support to position the platter carried by the aligned shelf for sliding movement onto the corresponding support, and wherein said mechanism includes a plurality of reciprocable pusher members operably associated with corresponding supports for movement in unison toward and away from the supports along paths of travel overlying and crossing the aligned shelves for engagement with any products thereon to move each engaged product onto the corresponding support, whereby a platter on an aligned shelf corresponding to an empty support is moved from such shelf onto the support to restock the latter.

Other objects will become apparent as the detailed description proceeds.

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In the drawings:

FIGURE 1 is a rear elevational view of the vending apparatus with the rear of the housing removed;

FIG. 2 is a condensed, sectional view taken along line 2-2 of FIG. 1;

FIG. 3 is a sectional view taken along line 3-3 of FIG. 2, the lower portion of the figure being expanded as compared with the corresponding showing in FIG. 2 to illustrate the plurality of shelves carried by the lower conveyor;

FIG. 4 is a sectional view taken along line 4-4 of FIG. 3;

FIG. 5 is a sectional view taken along line 5-5 of FIG. 2; and

FIG. 6 is an electrical schematic diagram of the control apparatus of the instant invention.

Referring to FIGS. 1-5, the numeral 10 designates a normally heated or refrigerated housing for the vending apparatus of the present invention. Within the housing 10 a pair of upright channel members 12 and 14 rigid with the housing form structural supports for apparatus to be hereinafter described. A plate 16 is attached to and spans the distance between members 12 and 14 along the rear of the housing and approximately half way between the upper and lower ends thereof.

Forwardly of channel members 12 and 14 another pair of channel members 18 and 20 are vertically disposed and secured to housing 10. Upper and lower shafts 22 and 24 extend horizontally between channel members 12 and 18 and have their ends journaled thereon. The bearings for upper shaft 22 are illustrated at 26 and 28 in FIG. 2. Bearings 30 and 32 mounting the ends of lower shaft 24 on the channel members are best shown in FIG. 4. Similarly, another pair of upper and lower shafts 34 and 36 are horizontally aligned with shafts 22 and 24, respectively, and extend between channel members 14 and 20. The bearings 38 and 40 journaling shaft 36 to the channel members are revealed in FIG. 4.

Shafts 22 and 24 are disposed adjacent the left side of housing 10 while shafts 34 and 36 are located adjacent the right side of housing 10. A pair of chain and sprocket assemblies 42 and 44 are carried by shafts 22 and 24, assembly 42 being disposed at the ends of shafts 22 and 24 adjacent channel member 12. Assembly 44 is disposed at the ends of shafts 22 and 24 adjacent channel member 18. The sprockets of the respective assemblies 42 and 44 are rigid with the corresponding shafts.

Similarly, shafts 34 and 36 carry a pair of chain and sprocket assemblies 46 and 48, assembly 46 being disposed at the ends of shafts 34 and 36 adjacent channel member 14 while assembly 48 is mounted on the ends of shafts 34 and 36 adjacent channel member 20.

The chain 50 of assembly 42 and the chain 52 of assembly 44 are interconnected by a plurality of pivot rods 54. Each rod 54 forms the hinge pin of a pair of offset hinges 56 and 58. A shelf 60 extends horizontally from each pair of offset hinges 56 and 58. A pair of flanges 62 and 64 depend from hinges 56 and 58, respectively, and each have a pair of laterally extending ears 66. Ears 66 ride on a vertically disposed plate 68 attached to channel members 12 and 18 when shelves 60 are in a position to receive products to be vended (as will be hereinafter described).

The chain and sprocket assemblies 46 and 48 mounted on shafts 34 and 36 carry components identical to that as described above for assemblies 42 and 44. Therefore, such identical components have the same reference characters except for the addition of the prime notation.

It may be appreciated that chain and sprocket assemblies 42, 44, 46, and 48 and their associated components form a conveyor, the opposed shelves 60 and 60' each

receiving and storing thereupon a product 70 to be vend-
ed. Products 70 may be the meal platters discussed pre-
viously in this specification or any other similarly pack-
aged product. Each pair of chain and sprocket assem-
blies, when actuated, moves in the direction shown by the
appropriate arrow to advance the shelves downwardly. It
may be appreciated that after the shelves pass the lower-
most position thereof (for purposes to be hereinafter de-
scribed) the shelves then advance upwardly along the
adjacent side wall of housing 10 in the retracted position
shown. This retracted or folded position is made possible
due to the actions of the appropriate hinges 56 and 58
or 56' and 58'.

A lower conveyor shown in FIG. 3 identical in struc-
ture to the upper conveyor described above includes
upper and lower shafts 72 and 74 vertically aligned with
shafts 22 and 24 and journaled on channel members 12
and 18 and upper and lower shafts 76 and 78 vertically
aligned with shafts 34 and 36 and journaled on channel
members 14 and 20. A pair of chain and sprocket as-
semblies interconnect shafts 72 and 74 in the same manner
as for the upper conveyor, assembly 80 being shown in
FIG. 3. Similarly, a pair of chain and sprocket assem-
blies interconnect shafts 76 and 78, assembly 82 being
visible in FIG. 3.

Shelves 84 and 84' mounted on the chain and sprocket
assemblies of the lower conveyor each carry products 86
to be vend and advance the products upwardly when
the conveyor is actuated. The arrows indicate the direc-
tions of movement of the appropriate chain and sprocket
assemblies.

The conveyors are each driven by separate drive means.
Referring particularly to FIGS. 1 and 2, it may be seen
that an electric motor 88 located at the upper rear of
housing 10 is operably coupled with the adjacent end of
shaft 22 by chain 90. Chain 90 is coupled with an idler
sprocket 92, a pair of driven sprockets 94 and 96, and
a drive sprocket 97 on the shaft of motor 88. The idler
sprocket 92 causes the chain 90 to rotate the driven
sprockets in opposite directions. Sprocket 96 is rigid
with shaft 22, while sprocket 94 is rigid with shaft 34.

Particularly in FIGS. 1 and 4, the drive means for
the lower conveyor may be seen. Such drive means in-
cludes an electric motor 98, a drive sprocket 100, a pair
of driven sprockets 102 and 104, an idler sprocket 106,
and a chain 108 intercoupling the sprockets. Idler sprocket
106 allows driven sprockets 104 and 106 to rotate in op-
posed directions when the chain 108 is advanced. Al-
though it cannot easily be seen in the drawings, it should
be understood that driven sprocket 102 is rigid with the
end of shaft 78 adjacent channel member 14 and that
driven sprocket 104 is mounted on the end of shaft 74
adjacent channel member 12.

Forwardly of the lowermost shelf 60-60' and aligned
therewith is a product support or platform 110 secured
to the channel members 18 and 20. On the front of the
machine is a door 112 mounted on a hinge 114 which
may be swung open by a customer. Door 112 is of re-
cessed design and, when closed, is snugly received by
vertical frame members 116 and 118 and horizontal
frame members. The upper horizontal member is not
shown in the drawings, the lower horizontal member
being visible in section at 124 in FIG. 2. Door 112 is
provided with a central, transparent window 120 which
permits the customer to view the product on support 110.
Further, a handle 122 facilitates opening of the door.

A product support or platform 126 is mounted on chan-
nel members 18 and 20 and is aligned with the uppermost
shelf 84-84' of the lower conveyor. A door 128 permits
customer access to products on support 126, door 128
being identical with door 112 in both construction and
function.

Between the upper conveyor and the lower conveyor
a horizontal track is provided comprising an upper,

transversely T-shaped guide 130 and a lower guide 132
of transversely, inverted, T-shaped configuration. The
guides are attached at one end thereof to plate 16 and
extend horizontally forwardly in alignment with a parti-
tion 134 that separates product supports 110 and 126.
Between guides 130 and 132 a shiftable block 136 is
disposed having grooves 138 and 140 therein receiving
flanges 142 and 144, respectively, on guides 130 and
132.

An electric motor 146 has a chain and sprocket drive
assembly 148 coupled with its output shaft and disposed
between guides 130 and 132 as may be clearly seen in
FIG. 2. A pin 150 attached to chain 152 of drive assem-
bly 148 extends laterally outwardly from the chain and
is received by a vertical slot 154 in block 136. Ener-
gization of motor 146 actuates drive assembly 148 and
thereby reciprocates block 136 between the ends of guides
130 and 132. During reciprocation it may be appre-
ciated that the grooves 138 and 140 in block 136 slide
along corresponding flanges 142 and 144 on the guides
and that vertical movement of pin 150 in slot 154 permits
reversal of the direction of travel of block 136 at each
end of its path of travel.

A pair of pusher members 156 and 158 are coupled
with block 136 by a cross member 160 integral with the
pusher members. Connection of the cross member 160
with block 136 is effected by the welding of a flange 162
integral with the central portion of the cross member
to the forward face of the block. Block 136 thus forms
a carrier for the pusher members 156 and 158.

The opposed ends of cross member 160 are provided
with offsets 164 and 166 which position the correspond-
ing pusher members adjacent the rear of products 70 and 86
located on the lowermost shelves 60-60' and the upper-
most shelves 84-84', respectively. During reciprocation
of block 136, pusher members 156 and 158 advance hori-
zontally forwardly to positions in front of the shelves
of the conveyors. In FIG. 4, the forward position of
pusher 156 is shown in dotted lines.

Referring to FIG. 6, the control circuitry for the instant
invention is shown. Lines 168 and 170 are coupled
with a source of electrical power (not shown). Motors
88, 98 and 146 are illustrated schematically. Doors 112
and 128 are shown in diagrammatic form.

Other components shown in the electrical schematic of
FIG. 6 and also revealed in FIGS. 1, 2 and 4 include a
product switch 172 having a switch arm 174, a product
switch 176 having a switch arm 178, an upper conveyor
switch 180, a lower conveyor switch 182, and a pusher
mechanism switch 184. Switch 172 is mounted on the
underside of product support 110 in alignment with a
slot in the support which permits arm 174 to rise up-
wardly out of the major plane of the support when no
product is on the support. This is illustrated in FIG. 2
where arm 174 may be seen due to the absence of a
product on support 110. Switch 176 is mounted on the
underside of product support 126 in identical fashion as
described for switch 172 and support 110, but the switch
arm 178 is not visible in FIG. 2 due to the presence of a
product 86 on the support which depresses the arm and
actuates the switch.

Switch 180 controls the power circuit to motor 88 and
has an actuator arm extending therefrom which is oper-
ated by a plurality of spaced pins 186 attached to chain
90 at intervals that will cause the upper conveyor to
shift a distance equal to the spacing between adjacent
shelves when the chain is advanced a distance equal to
such intervals. Similarly, switch 182 controls the opera-
tion of motor 98 and has an actuator arm which is
operated by a plurality of spaced pins 188 attached to
chain 108. Switch 184 controls the energization of motor
146 and is actuated by an arm which is engageable with
cross member 160 when the pusher members are in the
positions shown by the full lines in the drawings.

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In FIG. 6 it may be seen that switch 180 is of the double-pole double-throw type and is provided with a pair of movable poles 190 and 192. Switches 182 and 184 are also of the double-pole double-throw type, switch 182 having movable poles 194 and 196 and switch 184 having movable poles 198 and 200. Switches 180, 182 and 184 are all shown in their normal positions corresponding to stand-by operation of the vending machine prior to the vending of an article therefrom. The actuator arms of switches 180, 182 and 184 are biased so as to urge the movable poles of the switches out of the normal positions shown and into the actuated positions thereof, the poles being held in the normal positions by the engagement of the actuator arms with the appropriate pins or cross member as the case may be. Switch arms 174 and 178 are shown disengaged from their respective contacts, such being the positions of arms 174 and 178 when no product is present on the respective supports.

Switches 202 and 204 are single-pole double-throw, deposit-sensing switches and are coupled, respectively, with doors 112 and 128. Single-pole, double-throw switch 206 is operatively coupled with both of the doors 112 and 128 by mechanical means. Conductor 208 connected to the lower contact of switch 206 is coupled with a coin accept solenoid and with the reset solenoid of a totalizer device (neither of these solenoids is shown in the drawings). Coil 210 is the solenoid of a captive latch to be hereinafter described, and rotary switch 212 is the switch structure of the aforesaid totalizer device.

It should be understood that switch 206, latch solenoid 210, and the totalizer device including the rotary switch 212 are all conventional components well known and used in the vending machine art. More specifically, the totalizer device comprises a stepper relay having a stepper solenoid, a reset solenoid, and the rotary switch 212 which is actuated by both of the solenoids. Each time the stepper solenoid is energized, the rotary switch advances one increment to the next switch position against the bias of a reset spring. The rotary switch is provided with a ratchet which engages a pawl which, in turn, is operably coupled with the reset solenoid. The rotary switch will continue to advance and the pawl will continue to engage the ratchet until the reset solenoid is energized, whereupon the rotary switch returns to its initial position as shown in FIG. 6.

The mechanical means coupling switch 206 with doors 112 and 128 may comprise a conventional captive link mechanism which is operably coupled with a shiftable bar for moving the bar when one of the doors is opened. In turn, shifting of the bar operates switch 206. The bar is shifted by movement of any of the links, but once certain of the links are moved by the opening of a door the captive mechanism operates to prevent opening of the other door.

The bar is normally maintained against shifting by the links through the use of a latch. This latch is operably coupled with solenoid 210 which, upon energization thereof, releases the latch to permit shifting of the bar. Subsequent deenergization of solenoid 210 effects relatching of the bar when the latter is returned to its normal position.

Operation

The machine is loaded from the rear by placing the products on all of the horizontal shelves of the conveyors except the lowermost shelves 60-60' and the uppermost shelves 84-84'. The automatic mechanism may then be energized to load the supports 110 and 126 in a manner to be hereinafter described, or the supports may be manually stocked during the loading operation. A pair of stops 238 and 240 secured to the housing are provided to facilitate the proper alignment of the products on the various shelves.

To operate the machine appropriate coinage is inserted

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by the customer into conventional vending machine coin-receiving apparatus (not shown). As the coins are received by the machine they successively energize the stepper solenoid of the totalizer which advances rotary switch 212 in increments. For purposes of illustration the contacts on switch 212 are numbered to correspond to successive 5¢ deposits. Thus, assuming that the customer desires to purchase the product located on support 110, a 15¢ deposit is required in order to gain access thereto through door 112.

When switch 212 engages the contact labeled "15," slight movement of door 112 moves switch 202 into engagement with its lower contact and establishes the following electrical circuit: From line 168 through switch 206, along lead 214 to switch 202, along lead 216 to switch 212, through solenoid 210 and then along lead 218 to pole 198 of switch 184, and thence along lead 220 to line 170. Thus, switch 202 serves to sense the presence of the deposit in the machine of the proper amount of coinage and permits the energization of solenoid 210 to release the latch, thereby allowing full opening of door 112.

As door 112 is swung open, switch 206 is moved into engagement with its lower contact. This connects conductor 208 with line 168 to energize the coin-accept solenoid and the reset solenoid, the latter resetting the totalizer to the initial position shown. Once the door is fully open, the customer removes the product from support 110, which removal causes switch arm 174 to engage its contact (switch arm 174 was previously held out of engagement with its contact due to the weight of the product 70 thereon). This establishes the following electrical circuit: From line 168 to switch 206, along lead 222 to switch arm 174, along lead 224 to pole 192 of switch 180, and hence along lead 226 through motor 88 to line 170. Motor 88 is thus momentarily energized until the pin 186 engaging the actuator arm of switch 180 is advanced to a location where the actuator arm no longer maintains poles 190 and 192 in the normal positions shown in FIG. 6. When this occurs, leads 224 and 226 are no longer interconnected and motor 88 is de-energized. It should be understood that the initial movement of the upper conveyor caused by the momentary energization of motor 88 in response to closing of the product-responsive switch arm 174 moves the upper conveyor only a very short distance at this time. At this juncture the operation of the various motors remains static until door 112 is closed.

Closure of door 112 returns switch 206 to the normal position shown in FIG. 6. The door is latched in place by the captive latch which was previously released by solenoid 210 when the door was opened. The following electrical circuit is created: From line 168 to switch 206, along lead 228 to pole 192 of switch 180, and hence along lead 226 through motor 88 to line 170. Motor 88 is thus re-energized to advance the upper conveyor until the next pin 186 engages the actuator arm of switch 180 to return poles 190 and 192 to the normal positions shown. This motion of the conveyor moves a loaded shelf 60-60' into alignment with support 110.

Simultaneously with the operation of the upper conveyor just described, the following electrical circuit is also created: From line 168 to switch 206, along lead 228 to pole 194 of switch 182, along lead 230 to pole 190 of switch 180, along lead 236 to pole 200 of switch 184, and then along lead 234 through motor 146 to line 170. This momentarily energizes motor 146 until cross member 160 moves off of the actuator arm of switch 184 to move the poles 198 and 200 of switch 184 into engagement with their lower contacts. This breaks the electrical continuity between leads 236 and 234. The pushers 156 and 158 are thus moved only a very short distance.

The return of pole 190 to its normal position following the conveyor movement above described now creates the following electrical circuit: From line 168 to switch 206,

along lead 228 to pole 194 of switch 182, along lead 230 to pole 190, along lead 232 to pole 200 of switch 184, and then along lead 234 through motor 146 to line 170. Motor 146 is thus reenergized to move pusher 156 forwardly into engagement with the next product 70 to be vended to slide the product off of the shelves and onto support 110. Pusher 156 then retracts to its normal position shown by the full lines in the drawings and halts in such position due to the re-engagement of cross member 160 with the actuator arm of switch 184. Poles 198 and 200 are thereby returned to the normal positions shown and the automatic restocking cycle is completed.

It should be noted that during the restocking of support 110 with the next product 70 the product support 126 was unaffected. The product 86 which was previously on the uppermost shelves 84-84' is removed therefrom and located on product support 126 so that pusher 158 did not engage any product during the restocking of support 110.

The vending of products from support 126 is substantially identical to that as described for support 110. One exception is that switch 212 must be advanced by appropriate coinage into engagement with the contact labeled "25" before door 128 may be fully opened by the customer. It will be appreciated that motor 98 driving the lower conveyor will be energized during the vending of products from support 126 for the purpose of restocking the support. Furthermore, it should be noted that pole 198 of switch 184 serves to prevent the initiation of another vending cycle until completion of the restocking operation, regardless of which support is being restocked and even though coins have been deposited for another product, since solenoid 210 cannot be energized unless pole 198 is in engagement with its upper contact as shown.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a vending machine:

a plurality of supports, each for receiving a product to be vended;

conveyor means operably associated with each of said supports respectively and including a plurality of product-bearing shelf structures, each of which is for slidably receiving thereon a product to be subsequently vended from a corresponding support, each conveyor means being shiftable in increments to sequentially dispose individual, loaded shelf structures thereof adjacent to and in alignment with the corresponding support to position the product carried by the aligned structure for sliding movement onto the corresponding support;

mechanism common to said supports including a plurality of intercoupled, reciprocable pusher members operably associated with corresponding supports for movement in unison toward and away from the supports along paths of travel which bring the members into engagement with any products on the aligned structures to move each engaged product onto the corresponding support; and

control means operably associated with said conveyor means and said mechanism and responsive to removal of a product from any of said supports for actuating only the conveyor means corresponding to the empty support to shift the same one of said increments to align one of the loaded structures thereof with the empty support, and for thereafter actuating the mechanism to slide the product off said one structure and onto the empty support, said control means including means operably associated with said supports for sensing said removal, means responsive to said sensing means for actuating the conveyor means corresponding to the empty support, and means responsive to completion of incremental shifting of the last mentioned conveyor means for actuating said mechanism.

2. The invention of claim 1, wherein said paths of travel

are substantially parallel, and wherein said mechanism further includes track means substantially parallel with said paths of travel, a carrier mounted on the track means for movement therealong, and drive means operably coupled with the carrier for shifting the latter along the track means, said members being attached to said carrier, said control means being operably coupled with said drive means.

3. The invention of claim 2, wherein said carrier is normally disposed on the track means with the members at the ends of their paths of travel remote from the corresponding supports, the drive means being operable to reciprocate the carrier when actuated by said control means.

4. In a vending machine:

a plurality of supports, each for receiving a product to be vended;

conveyor means operably associated with each of said supports respectively and adapted to carry a plurality of products to be subsequently vended from a corresponding support, each conveyor means being shiftable in increments to bring successive products thereon to a position for movement onto the corresponding support;

pusher means common to said supports and movable along paths of travel to engage a product at any of said positions and shift the same onto the corresponding support; and

operating means coupled with said pusher means and each of said conveyor means and responsive to removal of a product from any of said supports for shifting the conveyor means associated with the empty support and actuating said pusher means, said operating means including means operably associated with said supports for sensing said removal, means responsive to said sensing means for actuating the last mentioned conveyor means to shift the latter one of said increments, and means responsive to completion of incremental shifting of said last mentioned conveyor means for operating said pusher means, whereby to move a product onto the empty support to reload the latter.

5. In a vending machine:

a support for receiving a product to be vended;

conveyor means operably associated with said support and adapted to carry a plurality of products to be subsequently vended, said conveyor means being shiftable in increments to bring successive products thereon to a position for movement onto said support;

pusher means movable along a path of travel to engage a product at said position and shift the same onto the support; and

operating means coupled with said pusher means and said conveyor means for actuating the same when a product is removed from the support, and including means operably associated with said support for sensing removal of the product, means responsive to said sensing means for actuating said conveyor means to shift the latter one of said increments, and means responsive to completion of incremental shifting of the conveyor means for operating said pusher means, whereby to move a product at said position onto the support.

6. In a vending machine:

a support for receiving and displaying a product for vending;

a product conveyor for storing a quantity of said products to restock said support and shiftable vertically to successively and singly convey said products to a position adjacent to and on a level with said support;

product sensing means underlying the product displayed on said support and responsive to removal of the product for effecting shifting of said conveyor to convey another of said products to said position; and

pusher means responsive to completion of shifting of
said conveyor for horizontally moving said last men-
tioned product from said position thereof onto said
support and over said product sensing means.

References Cited by the Examiner

UNITED STATES PATENTS

2,279,936 4/42 Brodie et al. ----- 221—125 X
2,477,239 7/49 Cease ----- 221—11

2,847,146 8/58 Obourn ----- 221—129
2,884,110 4/59 Krasney ----- 221—2 X
2,957,603 10/60 Dubois ----- 221—11

FOREIGN PATENTS

5 861,570 2/61 Great Britain.

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