A slant-shelf type article dispensing or vending machine having a plurality of selectable shelves and adapted to dispense articles successively from various sections of any selected shelf is provided with improved structure for retaining and releasing articles from the sections of the shelves and for disabling particular shelves when a sold-out condition is sensed relative to any section of such shelf. The article retaining and releasing structure is normally locked against movement to release an article by external forces applied directly to an article-blocking member such as may occur during attempted pilferage, and means are provided for positively shifting the blocking member to an article-releasing position when authorized dispensing of an article is desired. The sold-out structure includes means for sensing the presence of an article in position to be dispensed for each section of each of the shelves and means for successively enabling only those sensing means associated with the particular section of each of the shelves from which an article is next to be dispensed.

5 Claims, 12 Drawing Figures
INCLINED SHELF VENDING MACHINE

This invention relates to article dispensing or vending machines of the slant-shelf type and, more particularly, to improvements in the article retaining and releasing structure and the sold-out condition responsive control structure of such machines. An illustrative machine of the subject general class is disclosed in the copending application Ser. No. 884,811, now U.S. Pat. No. 3,627,172, of LeRoy D. Gore, Kermit W. Dyer, and Charles A. Moss, filed Dec. 15, 1969, and assigned to the same assignee as this application.

Prior article dispensing machines of the slant-shelf type have characteristically presented special problems in the provision of article retaining and releasing structure of the desired simplicity, reliability and resistance to pilferage attempts. Such problem has been increased by the circumstance that the articles to be dispensed normally advance to a position from which they may be released under the influence of gravity acting upon their own weight or, perhaps, some relatively weak internal biasing force to aid the effect of gravity in causing the articles to slide toward the lower discharge end of the article-supporting, slant-shelf assembly. In dealing with such problem, heretofore conventional machines have normally employed some sort of stop, which is often fixed, at the bottom of the inclined shelf, together with some mechanism for lifting or tipping the lowermost article over the stop for discharge from the shelf when desired. Such mechanisms have often proved unreliable under field conditions, as well as relatively susceptible to pilferage. Also, conventional article retaining and releasing mechanisms heretofore employed in this class of machine have been ill-adapted to handle articles of differing sizes and configurations without adjustment or even replacement of certain portions of the mechanism associated with each section of each shelf, depending upon the size and configuration of the articles to be handled.

In this class of machine, it has been conventional to provide structure for sensing the presence or absence of an article in position to be vended at each of the several sections of each shelf, which structure cooperates with the article retaining and releasing structure, as well as the article-selecting structure normally provided, in an effort to warn users of a sold-out condition that would prevent dispensing of an article from any particular shelf before that shelf has been selected. The sold-out structures heretofore employed for such purpose, however, have been subject to one of two disadvantages. Some of such structures provide warning of a sold-out condition only if there is no article in position to be dispensed from any of the several sections of a given shelf, which may result in abortive dispensing cycles in a pure dispensing machine or in cheating a customer in a vending machine equipped with coinage-responsive means for enabling the machine to perform a dispensing operation. Other sold-out mechanisms for such machines have provided for a sold-out warning for any given shelf upon sensing the absence of an article in position to be dispensed from any of the several sections of that shelf, which results in disabling such shelf at least prematurely and while there are other sections of such shelf from which articles could continue to be dispensed in the normal order of successive dispensing from the sections of that shelf before coming to a section of such shelf actually suffering from a fault condition.

Accordingly, it is the primary object of this invention to provide improved slant-shelf dispensing machines in which the article-blocking member forming a part of the article retaining and releasing mechanism is pivotally mounted adjacent the lower end of each article-receiving section of the shelves, and in which such member is shiftable during a dispensing operation from a normal article-blocking position to an article-releasing position permitting the lowermost article in the section to move across the shifted member under the influence of gravity for discharge to an article-access station.

It is another important object of the invention to provide such machines which include means for positively locking the shiftable article-blocking member in its normal article-retaining position until internal operating structure of the machine has been actuated, in order to frustrate pilferage attempts involving external forces being applied to the shiftable member in an effort to swing the latter to its article-releasing position other than by normal operation of the machine.

It is another important object of the invention to provide such a machine in which the operating structure for the shiftable blocking member includes an element serving the dual function of urging the lowermost article on to the member as it is shifted and simultaneously presenting a stop engageable with the next higher article for retaining all except the lowermost article on the shelf during an operation for dispensing such lowermost article.

It is another important object of the invention to provide such a machine in which each article-receiving section of every shelf is provided with independently operable feelers means for sensing the presence or absence of an article at the lowermost position of such section, together with means normally disabling the feelers associated with all sections of the shelves except the particular single section of each shelf from which an article is next to be dispensed during the normal order of dispensing articles successively from the various sections of each shelf.

It is another important object of the invention to provide such a machine in which the means for controlling enablement and disenableness of the sold-out condition sensing feelers is operably associated with, driven by the same forces as, and automatically synchronized with the means provided for controlling the dispensing of articles successively from the various sections of each shelf.

Still other important objects and advantages of the invention will hereinafter be made clear or become apparent to those skilled in the art from the disclosure of an illustrative, preferred embodiment of the invention.

In the drawings:

FIG. 1 is a front elevational view of the exterior of a typical slant-shelf type article dispensing or vending machine;

FIG. 2 is a fragmentary, front elevational view, internally of the machine, of a portion of several of the inclined article-supporting shelves and the drive and con-
control structure associated therewith, taken on irregular line 2—2 of FIG. 4.

FIG. 3 is a fragmentary, side elevational view, internally of the machine, of several of the article-supporting shelves and their associated control and actuating structures;

FIG. 4 is a fragmentary view, partially in side elevation and partially in cross section, taken on irregular line 4—4 of FIG. 2;

FIG. 5 is a fragmentary, top plan view of a portion of one of the shelves;

FIG. 6 is a fragmentary, bottom plan view of a portion of one of the shelves;

FIG. 7 is an enlarged, fragmentary, cross-sectional view taken on line 7—7 of FIG. 2, showing the sold-out sensing mechanism in a disabled condition;

FIG. 8 is an enlarged, fragmentary, cross-sectional view of the article retaining and releasing structure showing the shiftable retaining and releasing member in its article-blocking position and the operating means associated therewith in its standby condition;

FIG. 9 is a view similar to FIG. 8 except showing the article-releasing member and its associated operating means in an actuated condition for discharging an article;

FIG. 10 is a view of FIG. 9 except showing the article-retaining and releasing structure showing the shiftable retaining and releasing member in its article-blocking position and the operating means associated therewith in its standby condition;

FIG. 11 shows an enlarged, fragmentary perspective view of a portion of the common drive bar assembly shown in FIG. 3, viewing the same from the opposite side thereof; and

FIG. 12 is an enlarged, fragmentary, exploded perspective view showing the feeder and cam parts of one of the sold-out sensing mechanisms.

Referring now initially to FIG. 1 of the drawings, an improved slant-shelf type vending machine illustrative of a preferred embodiment of the invention is generally designated 20, having a cabinet 22 provided with an article-access opening 24, a plurality of article selection buttons 26, each having a sold-out condition indicator built therein, a plurality of selection identification windows 28, and, if desired, a coin-receiving mechanism 30.

Referring next particularly to FIG. 3, the cabinet 22 is internally provided with rear bracket means 32 and forward bracket means 34 for removably supporting a plurality of article-supporting shelves as at 36, 38, 40 and 42 at a forward incline sufficient for gravitational sliding movement of articles as at 44, 46, 48 and 50 toward the lowermost ends of the corresponding shelves. It will be understood that there is an article selection and sold-out indicating means 26 and a selection identification window 28 provided for and operably associated with each of the shelves 36, 38, 40 and 42, and it will also be noted that the articles 44, 46, 48 and 50 respectively received and supported upon the various shelves 36, 38, 40 and 42 may be of differing sizes and shapes, as well as having contents of differing nature or flavor.

As best shown in FIGS. 5 and 6, each of the article-supporting shelves 36 etc. is provided with raised divider means as at 52 and 54 separating the shelf into a plurality of side-by-side article-receiving sections 56, 58 and 60, each of which is preferably provided with raised contour portions as at 62 and 64 for reducing friction between the shelf 36, etc., and lines of articles 44 etc. slidably received and supported in a line upon each of the sections 56 etc.

Referring now back to FIG. 3, the machine 20 is provided with an upright actuating bar assembly 66 reciprocably mounted within the housing or cabinet 22 by any suitable means such as pins 68 and slots 70. Provision is made for reciprocating the bar assembly 66 downwardly upon actuation of any of the selection buttons 26 to initiate a dispensing cycle by means of a motor 72 coupled with the bar 66 in any suitable fashion, as by an eccentric cam 74 driven by the motor 72, a follower arm 76 engageable with the cam 74, and a link 78 coupling the arm 76 with the bar 66. The bar 66 is provided with a series of cutouts 80, one for each of the shelves 36, etc., presenting upper and lower laterally extending tabs 82 and 84, as best shown in FIG. 11.

Referring particularly to FIGS. 2, 3 and 4, it will be seen that each of the shelves 36, etc., is provided with an actuating crank 86 pivotally mounted on a shaft 88 and provided with a laterally extending stud 90. Each of the cranks 86 is coupled with the corresponding shaft 88 by means of a ratchet mechanism 92 including a spring 94 biasing a toothed part 96 of the crank 86 toward a toothed wheel 98 rigidly carried on the shaft 88. Each shelf 36, etc., is also provided with a solenoid 100 adapted to be operated by a corresponding one of the selection buttons 26 and provided with an operating arm 102 having an end flange 104 adapted to engage and swing the corresponding crank 86 from its normal position through a limited arc to a position moving the stud 90 into releasing space between the corresponding tabs 82 and 84 of the bar 66 for engagement thereby when the bar 66 is moved. Those skilled in the art will appreciate that the solenoid 100 is conventionally coupled with the selection buttons 26 by electrical circuit means generally indicated at 106, so that, upon actuation of a selection button 26, and after proper coin deposit in the mechanism 30 in a vending machine, the solenoid 100 for the particular shelf 36 etc., whose product has been selected, will be energized to swing the stud 90 of the corresponding crank 86 in a position for engagement by the upper tab 82 of the bar 66 when the latter is reciprocated downwardly by action of the cam 74 on motor 72, which is also energized by the initiation of a dispensing cycle pursuant to actuation of a selection button 26. Downward movement of the bar 66 will rotate the crank 86 of the selected shelf 36 etc., to ratchet and rotate the corresponding shaft 88 through a predetermined angular arc. The ratchet mechanism 92 is arranged so that each actuation of a crank 86 will rotate its shaft 88 through an angle substantially equal to 360° divided by the number of sections 56, etc., provided in each of the shelves 36 etc.

Each shaft 88 has mounted thereon for rotation therewith a separate cam 108 for each section 56 etc., of the corresponding shelf. Each cam 108 is provided with a raised contour portion 110 for controlling the article retaining and releasing structure hereinafter to be described, it being understood that the raised contour portions 110 of the various cans 108 on a given shaft 88 are angularly offset from each other by an angle substantially equal to the incremental rotation of the shaft 88 during each ratcheting thereof by the associated crank 86, and the offsetting of such contours 110 is preferably done between each successively adjacent cam 108 on each shaft 88 to provide for successive
dispensing of articles from the successively adjacent sections 56, etc., of any given shelf 36, etc., the angular offset being such as to automatically return to the section 56 at one side of a shelf 36, etc., for the next dispensing operation after an article has been dispensed from the section of the same shelf disposed at the opposite side of the latter. Thus, the offset cams 108 control the sequence of vending through the article retaining and releasing structure to be described in manner permitting successive discharge of the lowermost article from each of the sections 56, etc., of a given shelf in turn, then returning to dispense the previously next lowest article of each of such sections of that shelf in turn until all articles from all sections of a given shelf have been dispensed responsive to repeated selections of that shelf for operation.

Referring now particularly to FIGS. 9 and 10, a separate gate structure 112 is provided for each section 56, etc., of each shelf 36, etc., and is pivotally mounted as at 114 on the article-supporting shelf means adjacent the lower end of a corresponding section thereof. Each gate structure 112 includes a normally upstanding blocking member portion 116 extending upwardly and forwardly from the pivotal axis 114 and the corresponding shelf into a normal article-blocking position where it is disposed for engagement by a lowermost article 44 of the line of articles slidably supported upon the corresponding section 56, etc., of the particular shelf 36, etc., for retaining such articles 44 against further gravititational movement downwardly and off the lower end of such section. The article-retaining and releasing member 112 also includes a control portion 118 extending below the level of the pivotal axis 114 and provided with an internal cam surface 120 having a normally rearwardly facing face 122, a rearwardly disposed face portion 124, and a raised contour portion 126 therebetween.

An operating assembly 128 is provided for each of the article-retaining and releasing mechanisms 112 and includes a pair of spaced sidewalls 130 interconnected by a lifting and stop element 132 and pivotally mounted on the corresponding shelf 36 as at 134. Each operating assembly 128 is normally yieldably held in the standby position illustrated in FIG. 9 by a spring 136. Each operating assembly 128 is provided with a downwardly extending cam follower finger 138 adapted to cooperate with the corresponding cam 108 and be engaged by the raised contour portion 110 of the latter.

It will be understood that as the shaft 88 associated with a given shelf 36, etc., is incrementally rotated for successive dispensing operations from the various sections of such shelf, the raised contour 110 of the cam 108 for each section will engage the follower portion 138 of the corresponding operating mechanism 128 to swing and raise the latter about the pivotal axis 134 from the standby position illustrated in FIG. 9 to the operated position shown in FIG. 10. Affixed to at least one of the sidewalls 130 of each operating mechanism 128 is a lateral pin element 140 which extends into the internal cam surface 120 of the corresponding article-retaining and releasing gate mechanism 112. When the operating mechanism 128 is in its normal standby position as illustrated in FIG. 9, the pin 140 is disposed below the plane through the respective parallel pivotal axes 114 and 134 of the gate 112 and the operating mechanism 128, and is normally directly engaged with the rearward face 122 of the internal cam surface 120 to positively hold the gate 112 against rotation in a clockwise direction as shown in FIG. 9. As long as the operating assembly 128 remains in its standby position, the raised contour portion 126 of cam surface 120 is disposed behind the pin 140 to further prevent the gate 112 from being shifted from its article-blocking position by the application of external forces to the blocking member 116 during a pilferage attempt. As the operating assembly 128 is shifted to its operated position illustrated in FIG. 10 by the associated cam 108, however, the pin element 140 moves up the face 122 and around to the rearward face 124 of cam surface 120 thereby positively raising the control portion 118 of the gate 112 to swing the blocking member 116 about the pivotal axis 114 to an article-releasing position extending forwardly and downwardly from the lower end of the corresponding section of the shelf.

As will be clear from FIG. 9, as the operating assembly 128 commences to raise during operation thereof, the lifting and stop element 132 will engage the lower surface of the lowest article 44 to tilt and urge the latter on to the upper surface of the shifted member 116 from which it will be discharged for travel by gravity along a chute space 142 (see: FIG. 3) leading to the product access opening 24 in the cabinet 22. As best shown in FIG. 10, the lifting and stop element 132 also moves during operation of the assembly 128 into a raised position for engaging the front side of the next article 44 to prevent further downward movement of the latter and articles thereabove toward the lower end of the shelf section until a further incremental rotation of the shaft 88 during a successive dispensing operation from the same shelf has shifted the cam portion 110 from engagement with the follower portion 138, whereupon the operating assembly 128 will be returned to its normal standby position by action of the spring 136. It will be noted that, as the operating assembly 128 returns to its normal standby position, the pin element 140 thereon rides across the contour 126 of cam surface 120 and returns into engagement with the cam face 122 to again positively lock the gate mechanism 112 in its article-blocking position until the next operation of the assembly 128 by its associated cam 108.

Referring next particularly to FIGS. 4, 7, 8 and 12 wherein the improved sold-out mechanism of the invention is most clearly illustrated, it should be noted that the shaft 88 for each of the shelves 36, etc., is provided with a plurality of sold-out indication control cams 150 mounted thereon and rotatable therewith, there being a cam 150 for each of the sections 56, etc., of each shelf. Each cam 150 has a major annular surface 152 and a minor concave contour 154. The various cams 150 on the shaft 88 for a given shelf 36, etc., are angularly offset thereon in manner similar to the above described offsetting of the operating cams 108, except that the control cams 150 are so arranged that the concave contours 154 thereof will come into operative position as illustrated in FIG. 8 for that section 56, etc., from which the next article dispensing operation on that shelf is to be performed and will be in such operating position prior to commencement of a dispensing operation from that section, rather than moving into its operative position during the cycle of dispensing from that section as is done with the raised contours 110 of the operating cams 108. An article feeling finger 156 is provided for each section 56, etc., of every shelf 36, etc., and includes ears 158 pivotally mounting the
finger 156 on a shaft 160. Spring means 62 normally urges each finger 156 toward the enabled sensing position illustrated in FIG. 8 in which an extremity 164 of the finger extends upwardly above the level that would be occupied by a lowest member in position to be dispensed from the corresponding section of the shelf. As indicated in connection with the middle shelf depicted in FIG. 4, a lowest member 48 is in position engaging the blocking member 116 and ready to be dispensed, and such article 48 so engages the extremity 164 of the associated finger 156 as to swing the latter about the pivot shaft 160 to a position indicating the presence of the article 48 in a ready position. Each finger 156 is provided with an upturned follower portion 166 disposed to ride upon the surface of the corresponding cam 150.

While the follower portion 166 of any feeler finger 156 is riding upon the surface 152 of the corresponding cam 150, such feeler 156 will be held in the disabled position illustrated in FIG. 7, whether or not there is an article in the lowest member position ready to be dispensed from the corresponding section. During the dispensing operation from a preceding section, however, the cam 150 associated with the next section of the same shelf is rotated to a position aligning the concave contour 154 of such cam 150 with the raised follower portion 166 of the corresponding feeler 156, as shown in FIG. 8. This permits the finger extension 164 of such feeler 156 either to move to the raised position illustrated in FIG. 8 and in connection with the top shelf shown in FIG. 4, or to be held in its lower position by an article ready for dispensing as shown in connection with the middle shelf of FIG. 4. Thus, the cams 150 serve to automatically enable and disable the feelers 156, with only that feeler 156 associated with the section 56, etc., from which an article is next to be dispensed being enabled at any given time on each of the shelves 36 etc.

In order to accomplish a sold-out fault detection and indication when the absence of a properly positioned article is detected by an enabled feeler 156, each shelf 36 etc. is provided with an elongated member 168 common to the sections of a given shelf 36, etc., and also pivoted on the shaft 160 associated therewith (see FIG. 6). The member 168 is provided at one end thereof with an arm 170 engageable with the operating lever 172 of a sold-out switch 174 common to all sections of that shelf and coupled by electrical circuit means as generally indicated at 106 with the sold-out indicating light associated with the selection buttons 26 for that shelf. The member 168 for each shelf 36, etc., is yieldably urged by a spring 178 (FIG. 6) toward a tab position 176 provided on each of the feelers 156 associated with that shelf; thus, the members 168 are urged to rotate about the axes of shafts 160 in a clockwise direction as shown in FIGS. 4 and 7 and in a counterclockwise direction as shown in FIG. 8. FIG. 7 illustrates the relationship of the parts in connection with one of the sections 56, etc., which is not the next section of its shelf from which an article is next to be dispensed and assuming that there is no article in position ready for dispensing from the next section of that shelf from which a dispensing operation should occur. In FIG. 7, although there is no article at the lowest member portion of the section therein illustrated, it will be understood that the cam 150 of such section is holding the associated feeler 156 against swinging its finger 164 into the lowest member position on the shelf. Such feeler 156 is, therefore, in its disabled condition in which no article sensing thereby occurs. Assuming that there is no article in the lowest position on the section of the shelf from which a dispensing operation is next to occur, however, the enabled feeler 156 of the last mentioned section will have swung to the position illustrated in FIG. 8 and in connection with the topmost shelf depicted in FIG. 4 and, as it did so, its tab 176 will have engaged and rotated the member 168 about the axis of shaft 160. Such rotation of the member 168 will operate the sold-out switch 174 through the arm 170 associated with the member 168, but the member 168 will have also moved to a position out of contact with the tab portion 176 of the disabled feelers 156 associated with that shelf, as illustrated in FIG. 7.

It will be understood, therefore, that the tab portion 176 of only that particular feeler 156 that is enabled at the moment may engage and move the member 168 to register a sold-out condition. The middle shelf shown in FIG. 4 illustrates the other common situation in which an enabled finger 156 is being held depressed by the presence of an article 48 in position ready to be dispensed from the corresponding section. In this situation, the tab portions 176 of all of the feelers 156 associated with the shelf will be in longitudinal alignment and the member 168 will be in its normal position urged thereagainst by the spring 178, it being noted that the tab portions 176 of all of the disabled feelers 156 of a given shelf are maintained in alignment by the action of the associated followers 166 upon the surfaces 152 of the associated cams 150, while tab portion 176 of the enabled feeler 156 will either be held in such alignment by the presence of a lowest article in position to be dispensed or will swing out of such alignment to move and actuate the sold-out condition detecting member 168 as illustrated in FIG. 8 and in connection with the topmost shelf depicted in FIG. 4.

It should be apparent to those skilled in the art that the improvements contemplated and provided by the invention are well adapted to achieve the above-mentioned objects of the invention, as well as to provide simple, inherently reliable and economic structure for doing so. It should be further understood that minor changes of detail of construction from those shown and described for illustrative purposes could be made without departing from the true spirit of the invention. Accordingly, the invention should be deemed limited only by the fair scope of the claims that follow.

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

1. In an article dispensing machine:
   article support means having a plurality of elongated, side-by-side, longitudinally inclined sections each adapted to receive a plurality of articles arranged in a line extending longitudinally of said sections and to shiftably support said articles for movement toward and successive dispensing from the lower end of said sections;
   shiftable gate means adjacent the lower end of each of said sections movable between a blocking position for engaging and preventing further movement of the lowermost of said articles off the lower end of said section and an article-releasing position for dispensing said lowermost article from the lower end of said section;
shiftable operating means adjacent each of said gate means and movable between a normal standby position and an operated position; locking and actuating means operably coupling each of said operating means with a corresponding one of said gate means for locking said gate means in its blocking position when the corresponding one of said operating means is in its standby position and for moving said gate means to its article-releasing position when the corresponding one of said operating means is moved to its operated position; control means operably coupled with each of said operating means for moving each of said operating means to its operated position in a predetermined order of succession to normally dispense a lowermost article from the lower end of each of said sections in said successive order; and article-sensing means adjacent the lower end of each of said sections respectively for sensing the presence or absence of a lowermost article in position to be dispensed, said control means including means for selectively enabling operation of only that one of said sensing means associated with the particular section whose operating means is next in said order to be operated and for disabling the remaining of said sensing means.

2. The invention of claim 1, wherein there are a plurality of said support means one above the other and each provided with a plurality of said side-by-side sections, one each of said gate means, said operating means and said locking and actuating means for each of said sections, and one of said control means for each of said support means; there are means for selectively operating any of said support means to dispense an article therefrom, including a shiftable assembly common to said support means, means for shifting said assembly, and a plurality of coupling means for selectively coupling said control means of a selected support means with said assembly; there are means for sensing a fault condition involving the absence of a lowermost article in position to be dispensed in that section from which an article is next to be vended from each of said support means; and there are means responsive to each of said sensing means for disabling said coupling means for the corresponding support means whenever a fault condition is sensed.

3. The invention of claim 2, wherein each of said support means is provided with individual visual display means coupled with said fault detecting means for that support means for warning users against selecting an article for dispensing from that particular support means only when no lowermost article is in position to be dispensed from the next to be operated section of that support means despite possible absence of a lowermost article in position to be dispensed from other sections of that support means.

4. In an article dispensing machine; article support means having a plurality of elongated, side-by-side, longitudinally inclined sections each adapted to receive a plurality of articles arranged in a line extending longitudinally of said section and to shiftable support said articles for movement toward and successive dispensing from the lower end of said section; shiftable gate means adjacent the lower end of each of said sections movable between a blocking position for engaging and preventing further movement of the lowermost of said articles off the lower end of said section and an article-releasing position for dispensing said lowermost article from the lower end of said section; shiftable operating means adjacent each of said gate means and movable between a normal standby position and an operated position; locking and actuating means operably coupling each of said operating means with a corresponding one of said gate means for locking said gate means in its blocking position when the corresponding one of said operating means is in its standby position and for moving said gate means to its article-releasing position when the corresponding one of said operating means is moved to its operated position; control means operably coupled with each of said operating means for moving each of said operating means to its operated position in a predetermined order of succession to normally dispense a lowermost article from the lower end of each of said sections in said successive order; and article-sensing means adjacent the lower end of each of said sections respectively for sensing the presence or absence of a lowermost article in position to be dispensed, said control means including means for selectively enabling operation of only that one of said sensing means associated with the particular section whose operating means is next in said order to be operated and for disabling the remaining of said sensing means, said article-sensing means each including a shiftablefeeler adapted to engage and be held in a normal position by the presence of a lowermost article in position to be dispensed but to shift to a fault condition indicating position in the absence of a lowermost article thereat, said control means including a rotatable shaft common to said sections and having a separate fault indication control cam for each section respectively engageable with said feeler for that section, each of said control cams having a first contour portion for enabling the corresponding feeler for shifting into its fault indicating position and a second contour portion for holding said feeler against said shifting and in its normal position whether or not a lowermost article is present in position to be dispensed, said first contour portions of said control cams being angularly offset from each other for successive enabling of each of said sensing means only when its associated operating means is next in said order to be operated.

5. The invention of claim 4, wherein is provided fault detecting means common to said feelers and operably coupled therewith for detecting shifting movement of any of said feelers from its normal to its fault indicating position.