July 10, 1951 W. VON STOESER 2,559,690

CUP DISPENSING MECHANISM

Filed April 18, 1947 5 Sheets-Sheet 1

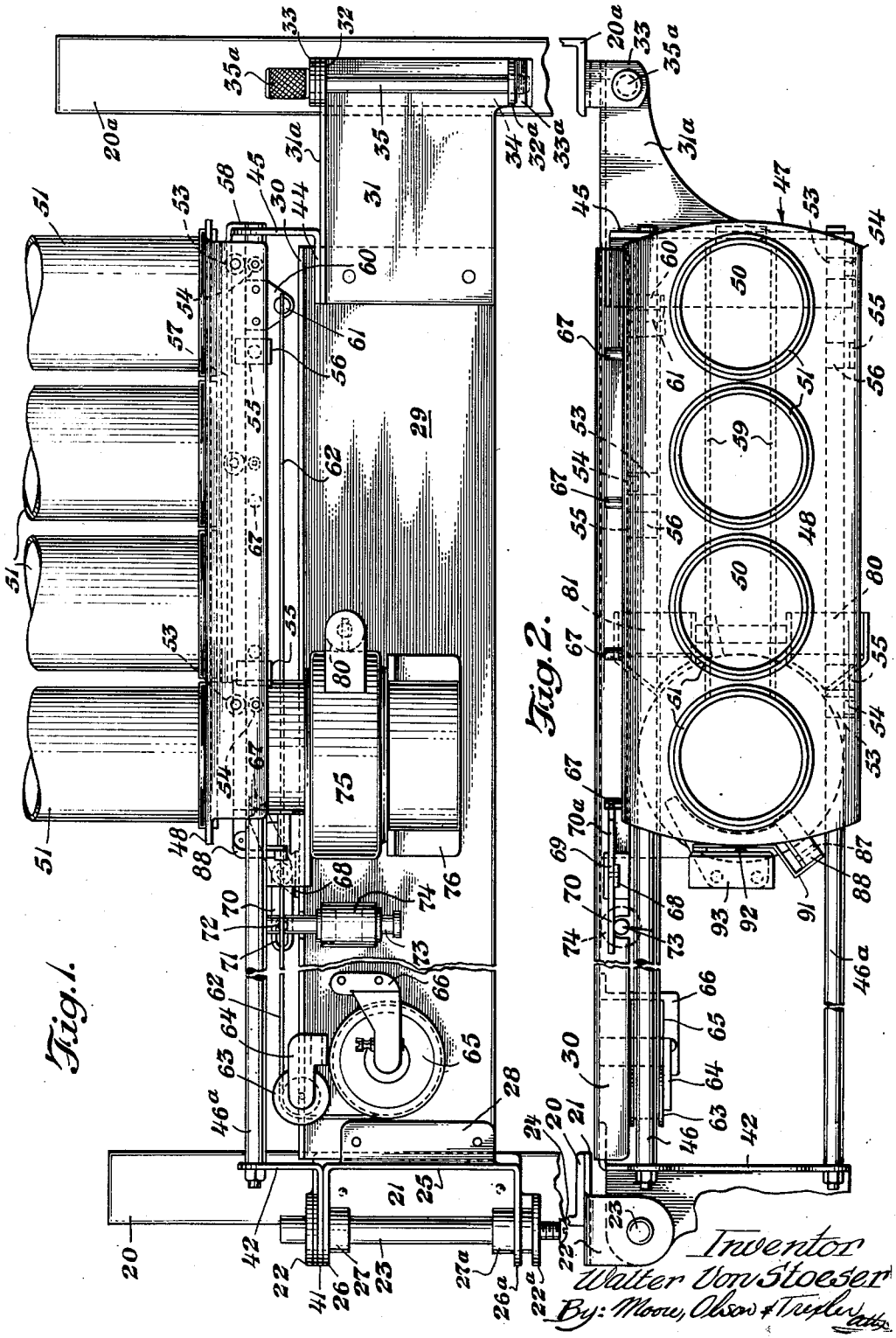


Fig. 1.

Fig. 2.

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CUP DISPENSING MECHANISM

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Fig. 3.

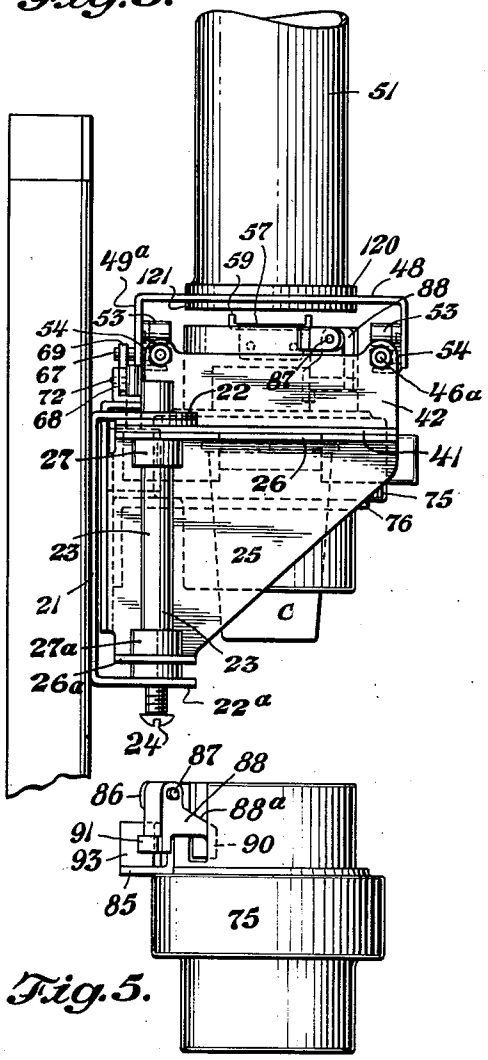


Fig. 4.

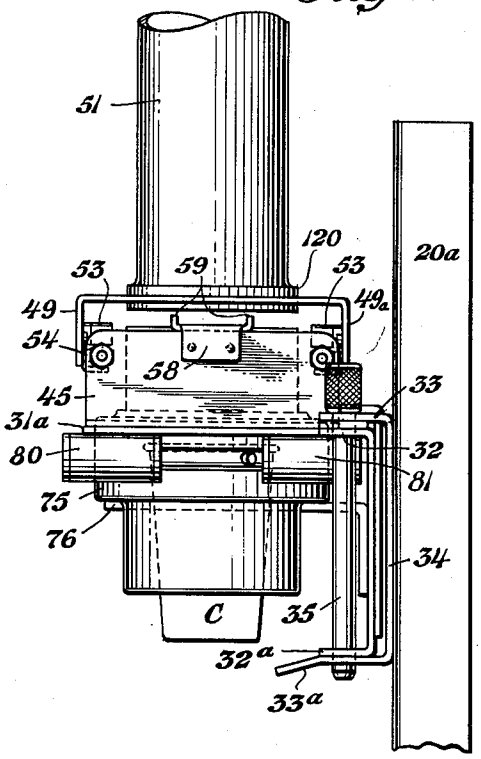


Fig. 5.

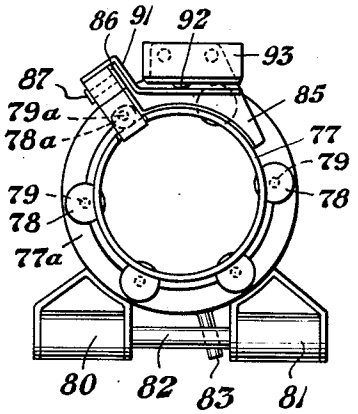


Fig. 6.

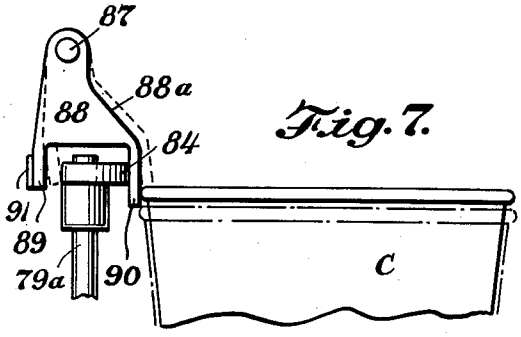


Fig. 7.

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CUP DISPENSING MECHANISM

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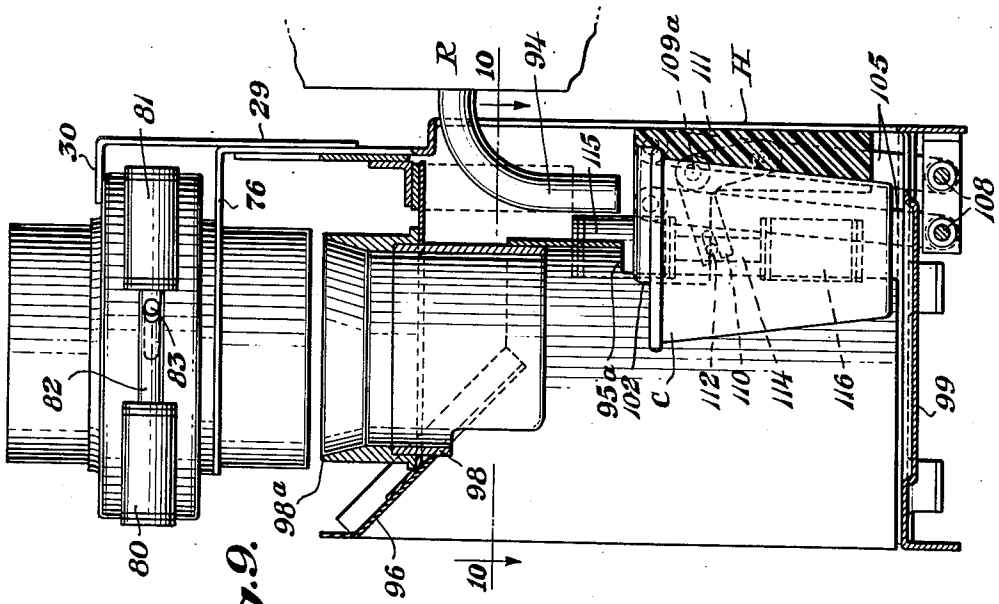


Fig. 9.

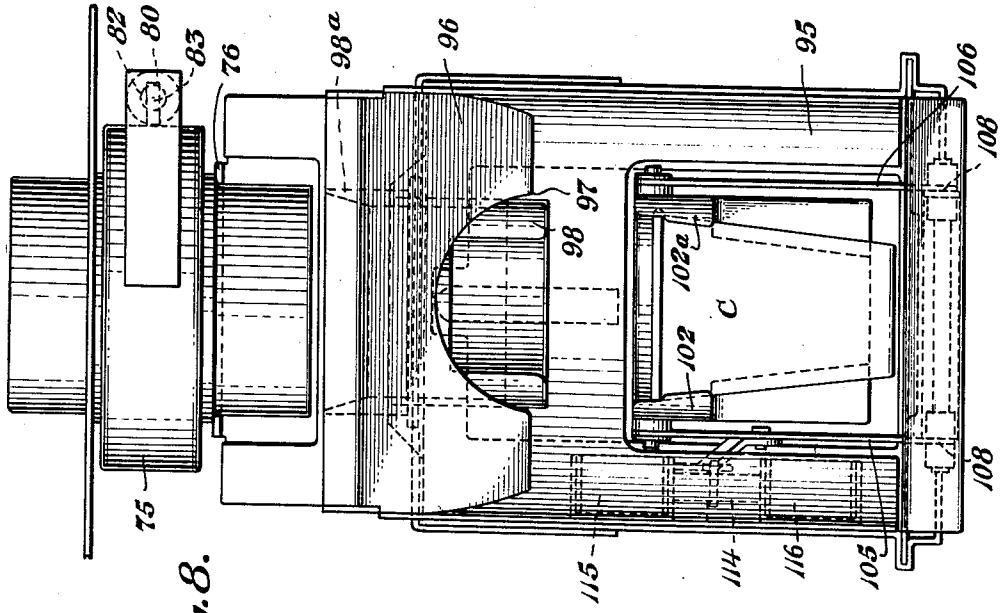


Fig. 8.

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CUP DISPENSING MECHANISM

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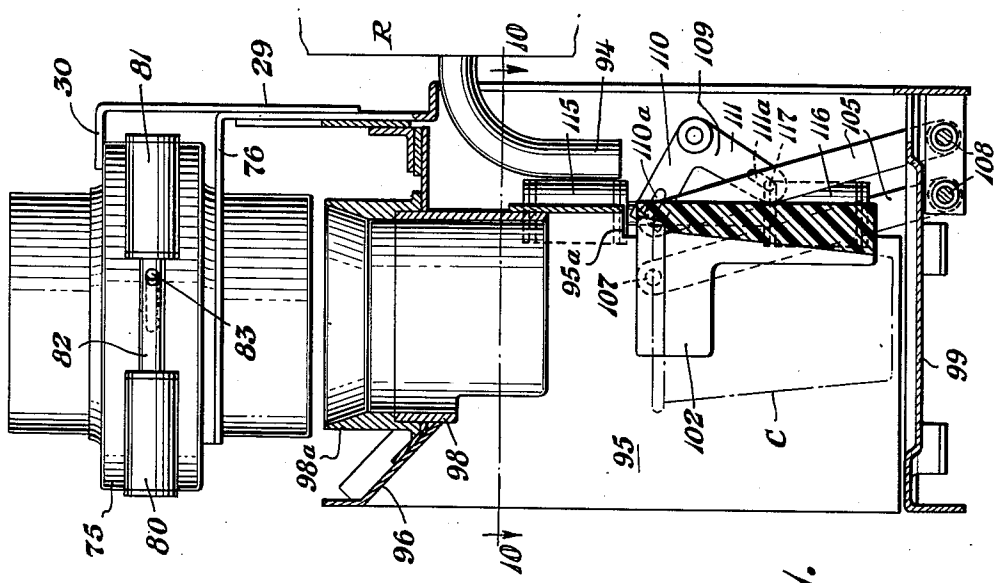


Fig. 11.

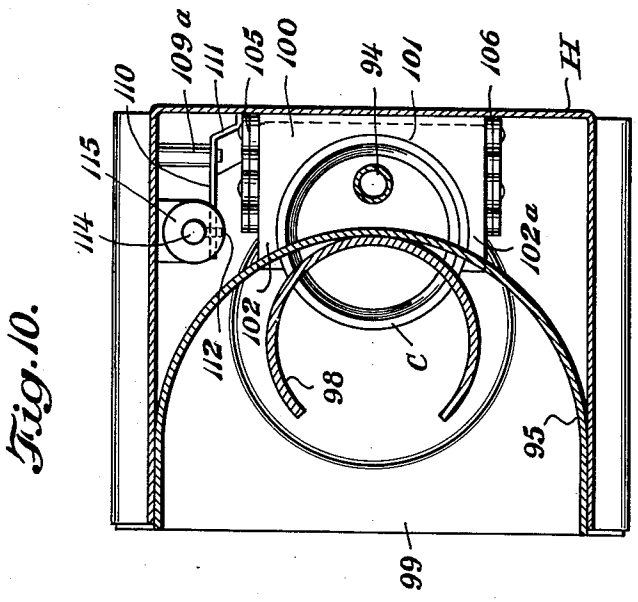


Fig. 10.

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CUP DISPENSING MECHANISM

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Fig. 12.

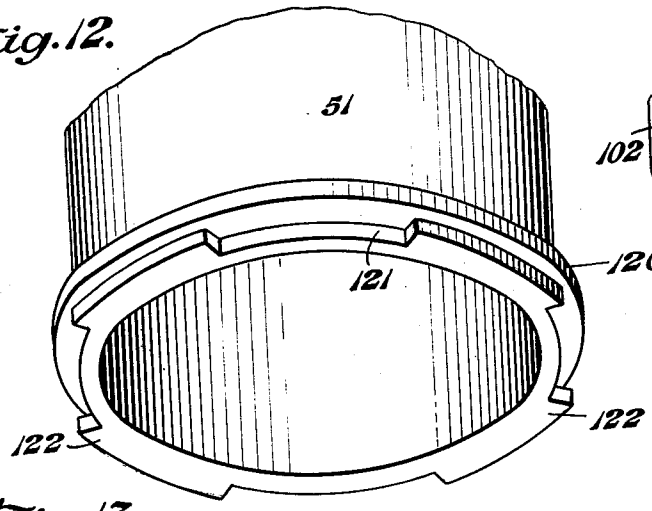


Fig. 14.

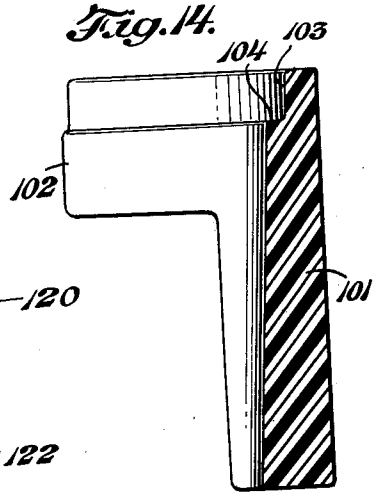
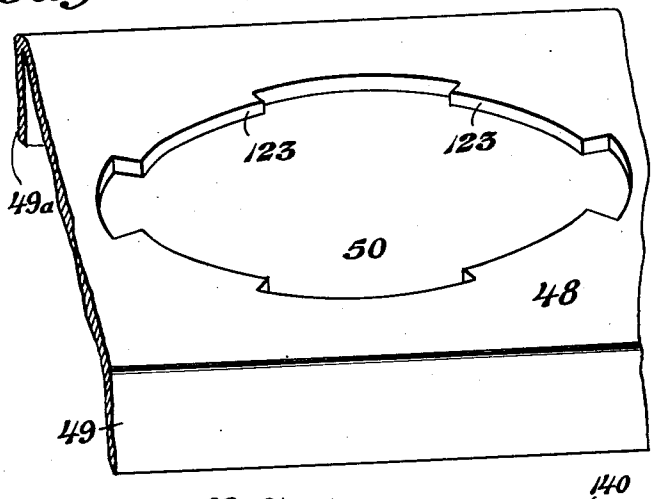


Fig. 13.



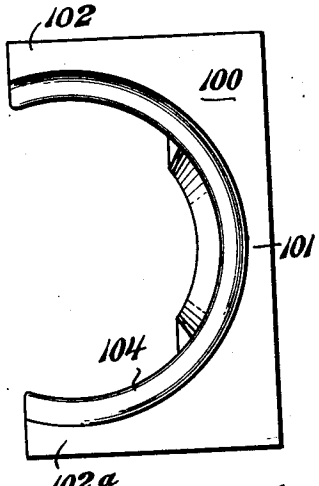


Fig. 15.

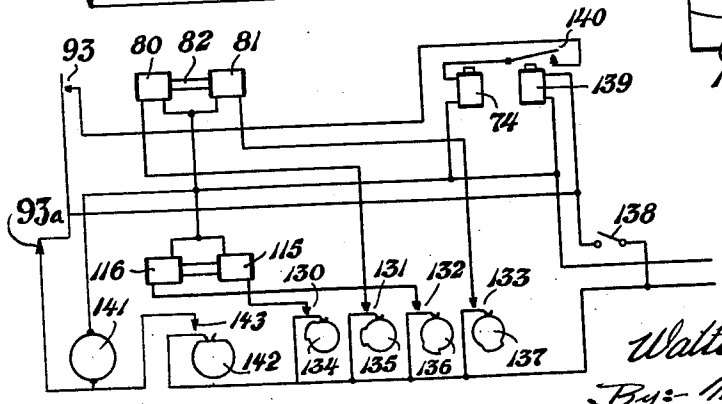


Fig. 16.

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2,559,690

UNITED STATES PATENT OFFICE

2,559,690

CUP DISPENSING MECHANISM

Walter Von Stoeser, North Tonawanda, N. Y., assignor to The Rudolph Wurlitzer Company, North Tonawanda, N. Y., a corporation of Ohio

Application April 18, 1947, Serial No. 742,253

7 Claims. (Cl. 312—44)

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The present invention relates generally to machines for dispensing stacked articles but is more particularly concerned with new and useful improvements in a machine for dispensing nested cups or other containers or similar articles.

While the invention is useful in the dispensing of various types of articles, the illustrated embodiment thereof is particularly designed and adapted for use with a coin controlled drink vending machine which may be of the general type shown in my copending application Serial No. 477,068. In this type of machine, there is provided a refrigerating cabinet for the coils through which the beverage passes to a dispensing spout. The cups are automatically positioned when delivered from a cup dispenser to a position beneath the spout from which issues a predetermined amount of beverage. The entire mechanism is enclosed within a suitable casing which is provided with a door controlled opening through which, when opened, the customer may conveniently remove a filled cup. The entire machine is coin controlled and automatic in operation.

According to the present invention there is a single cup dispensing station at which a dispensing mechanism operates to release an individual cup upon each cycle of operation of the machine. However, the single cup dispensing station is supplied successively by a plurality of magazines or compartments each containing a stack of cups, each compartment with its stack of cups being automatically advanced to the dispensing station upon depletion below a predetermined minimum of the stack of cups in the preceding compartment at the dispensing station.

With the above in mind, it is therefore an object of the present invention to provide a cup dispensing mechanism which is of new and improved construction and which possesses improved operating characteristics.

Another object of the invention is to provide a cup dispenser and loading mechanism therefor which is positive, prompt and entirely automatic in operation.

A further object of the invention is to provide improved mechanism for controlling the advance of the loading mechanism to present a new stack of cups to the dispenser upon depletion of a preceding stack.

A still further object of the invention is to provide improved supporting means for a cup dispenser and dispenser loading mechanism which is constructed and arranged so as to facilitate repair and replenishment of the several stacks of cups with a minimum of time and effort.

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The invention still further aims to provide mechanism of the above type which is relatively simple in construction, inexpensive to manufacture and readily assembled.

The above and various other objects, advantages and features of the invention will be apparent from the following specification taken in connection with the accompanying drawings wherein certain preferred embodiments of the invention are set forth for purposes of illustration and wherein like reference numerals refer to like parts throughout.

In the drawings,

Figure 1 is a fragmentary front elevation of the cup dispensing mechanism, the magazine loading mechanism, the means for controlling advance of the loading mechanism, and the supporting structure therefor;

Figure 2 is a top plan view of Figure 1;

Figure 3 is an end elevation viewed from the left of Figure 1;

Figure 4 is an end elevation viewed from the right of Figure 1;

Figure 5 is a detail elevation showing the cup dispensing housing with the switch operating lever which controls advance of the loading mechanism, the solenoid actuating mechanism for the individual cup dispenser being omitted;

Figure 6 is a detail top plan view showing the individual cup dispensing mechanism and the solenoid actuating means therefor;

Figure 7 is an enlarged detail showing the actuation of the switch controlling member for the loading mechanism, the full line position of the controlling member indicating when advance of the loading mechanism is prevented and the dotted line position thereof indicating when the loading mechanism is permitted to advance;

Figure 8 is a front elevation showing the cup receiver disposed in the compartment below the cup dispenser;

Figure 9 is a side view of Figure 8, partly in section and with the end wall removed, showing the position of the cup receiver and cup beneath the pouring spout;

Figure 10 is a sectional view taken substantially along the line 10—10 of Figure 9;

Figure 11 is a view similar to Figure 9 but showing the cup receiver and cup in position immediately beneath the cup dispenser;

Figure 12 is an enlarged fragmentary perspective view showing the locking mechanism at the lower end of one of the cup supply magazines;

Figure 13 is a fragmentary perspective view of the carriage and showing the means for cooperating with the locking means of each cup magazine;

Figure 14 is a vertical sectional view of the cup receiver;

Figure 15 is a top plan view of the cup receiver; and

Figure 16 is a wiring diagram showing the manner of operation of the various solenoid actuating devices.

Referring more in detail to the accompanying drawings, and particularly to Figures 1, 2, 3 and 4 thereof, the mounting for the individual cup dispensing mechanism and the cup stack advancing and replenishing mechanism is illustrated without reference to the complete machine. However, the angle irons **20**, **20***a* which serve as the primary supporting members for the cup dispensing and replenishing mechanisms are secured to the front of the refrigerating cabinet of a drink vending machine substantially of the type shown in my copending application Serial No. 477,068, and it is to be understood that this entire assembly is enclosed within a suitable type of outer casing having a door controlled opening through which, when open, the customer may withdraw a filled cup.

A hinge bracket **21** is secured by riveting or the like to the supporting angle member **20** and is provided with upper and lower apertured supporting flanges **22**, **22***a*, respectively, through which a hinge pintle **23** extends. The lower end of the hinge pintle may be threaded to receive a securing screw **24**. A bracket **25** is provided with similar horizontally extending apertured upper and lower wings **26**, **26***a* which are disposed in alignment with the hinge flanges and may be provided with bosses **27**, **27***a* through which the hinge pintle **23** extends. The bracket **25** is provided with a vertically disposed flange portion **28** which is riveted or otherwise suitably secured to the relatively deep web portion **29** of a bridge member **30** extending substantially across the space between the supporting angles **20**, **20***a*.

A bracket member **31** is provided with upper and lower apertured wings **32**, **32***a* which are disposed between the apertured hinge flanges **33**, **33***a* of a bracket **34** which is secured to the supporting member **20***a*. A securing pin **35** extends through the aligned hinge flanges and wings and is provided with a knurled end **35***a* by which it may be conveniently removed or fitted in place. The bracket **31** is secured by riveting or the like to the adjacent end of the web portion **29** of the bridge member **30** and the top of the bracket member **31** is provided with a horizontal flange **31***a* which extends outwardly or forwardly from the web portion **29**. Thus, the bridge member is secured between the supporting angles **20**, **20***a* and it may be swung outwardly about the axis of the hinge pintle **23** by removal of the locking pin **35**. However, depending upon the facilities of the particular machine in which the assembly is to be installed, the hinge connection can be provided on either supporting angle.

Adjacent the opposite end of the web **29** of the bridge member **30** there is provided a bracket member **41** resting upon the wing **26** which extends substantially forwardly and having an upstanding flange portion **42** also extending outwardly from the web **29** and being substantially coextensive with the outwardly extending portion of the flange **31***a* at the opposite side of the machine. The flange portion **31***a* supports a

bracket **44** having an upstanding flange portion **45** which is also substantially coextensive with the flange **42** at the opposite side of the assembly. Inner and outer horizontally disposed parallel rails **46**, **46***a* are suitably secured in the flange portions **42**, **45** adjacent opposite ends of the bridge member **30**. The rails **46**, **46***a* serve to support a carriage generally indicated by the numeral **47** which is adapted for rectilinear movement along the said rails. The carriage is preferably formed of sheet metal and is provided with a horizontal top portion **48** and depending flanges **49**, **49***a* at opposite sides thereof. The horizontal top portion **48** of the carriage is illustrated as being provided with four apertures **50** therethrough and each of these apertures is adapted to be aligned with a stack of cups housed within a series of four cylindrical magazines **51**, which are suitably mounted on the carriage in a manner to be hereinafter pointed out.

The depending flanges **49**, **49***a* of the carriage are provided with spaced cylindrical rollers **53** which may be mounted thereon by shouldered rivets or the like. These rollers extend inwardly from the flanges **49**, **49***a* and rest on the rails for supporting the carriage and the magazines. As illustrated, two of these rollers extend inwardly from the flange **49** and one roller extends inwardly from substantially the center of the flange **49***a* although any number or spacing of such rollers may of course be employed. In order to prevent lateral sliding of the carriage with respect to the rails, there is provided beneath each roller an inwardly extending stud **54**, the inner end of each stud being disposed a few thousandths of an inch away from the adjacent rail. There are also provided adjacent each roller depending straps **55** having the free lower ends **56** thereof extending inwardly beneath the adjacent rails so as to prevent tilting or elevation of the carriage with respect to the rails. A metal bracket **57** extends longitudinally of the carriage and is disposed centrally thereof. The end **58** of the bracket **57** is turned downwardly and secured to the flange **45**. The side edges **59**, of this metal strip are flanged upwardly and, as indicated in Figures 3 and 4, extend toward but not into contact with the bottom ends of the magazines. These flanges are located within the projected periphery of the openings **50** in the carriage top surface so as to support the stacks of the cups in the magazines which have not yet been advanced to the dispensing station. Thus, the flanges or rails **59** terminate at the first opening of the cup dispenser, as indicated in Figures 1 and 2.

At the right hand end of the carriage, as viewed in Figure 1, there is provided a depending bracket **60** having a slotted cross member **61** in which is secured a steel tape **62** or the like. This tape extends horizontally along and above the horizontal flange of the bridge member **30** and passes over an idler roller **63** which is supported on the web **29** of the bridge member by a bracket **64** or the like. The opposite end of the strip is secured to the winding drum **65** of any suitable type of spring motor which is tensioned to normally tend to shift the carriage toward the left of the supporting structure, as viewed in Figure 1. The spring motor and winding drum are also secured to the web by a suitable type of bracket **66**. It is to be noted that the idler roller **63** is positioned so that the runs of the steel strip or tape are substantially vertical and horizontal.

The flange **49***a* on the carriage is provided with equally space outwardly extending pins **67**, each

of which is positioned at a predetermined location with respect to a corresponding magazine 51. The horizontal flange portion of the bridge member 30 carries an upstanding bracket 68 to which is pivoted a lever 69 with the opposite arms 70, 70a thereof disposed at an obtuse angle to one another so that, in the position of Figure 1, the arm 70a extends upwardly into the path of the outwardly extending pins 67 and, as shown in this figure, this arm 70a is in contact with the first pin. The opposite end of the arm 70 is provided with a longitudinal slot 71 in which fits a cross pin 72 carried by the core element 73 of a solenoid 74 which is also mounted on the web of the bridge member. This solenoid 74 is of the type having a paramagnetic lower portion and a diamagnetic upper portion so that the core element 73 is normally held in the lowered position of Figure 1. It will be seen, therefore, that when the solenoid is energized the core element will shift upwardly and thus, through the pin 72 and slot 71 connection, will rotate the lever 69 so that the arm 70a descends out of the path of the pins. Then the spring motor, operating through the steel strip 62, will advance the carriage so as to position the next full magazine over the dispenser at which time the electric operating circuit, to be hereinafter described, will operate to deenergize the solenoid 74 and cause the arm 70a of the lever 69 to rise into the path of the next stop pin.

The mechanism for dispensing individual cups from the stack located at the dispensing station is of a more or less conventional type, as shown in Figure 6, and is enclosed within a housing 75 mounted on the web 29 of the bridge member by means of a bracket 76 or the like. This type of cup dispenser includes a ring 77 with a plurality of rollers 78 disposed on vertical shafts 79 around the inside wall of the ring. These rollers 78 support the stack of cups and cooperate with the beaded upper edges of adjacent cups to effect removal of an individual cup at the bottom of the stack upon actuation of the ring and the rollers carried thereby. Actuation of this dispensing mechanism is controlled by a pair of solenoids 80, 81 having a common core element 82 which is apertured to receive an arm 83 extending outwardly from the ring 77. These solenoids are suitably mounted on a stationary support 77a within which the ring 77 moves. Thus, movement of the core element from the "ready" position of Figure 6 toward the left will effect dispensing of the bottom cup from the stack. This type of dispensing mechanism is generally well known but it is slightly modified according to the present invention in order to provide positive control of the carriage advancing mechanism exactly in accordance with operation of the individual cup dispenser. To this end, the shaft 79a of one of the supporting rollers 78a is extended upwardly above the ring 77 and carries a cam member 84 which will assume movements of the adjacent roller 78a upon each individual cup dispensing operation. A bracket 85 is secured to the ring member 77 and is provided with an outward extension 86 which carries a pivot pin 87 for pivotally supporting a depending, oscillating switch controlling member 88. This switch controlling member 88 includes a body portion and a lower forked end defined by the arms 89, 90. The arm 89 is secured to a spring arm 91 which controls a switch button 92 of a conventional type of microswitch 93, which is also mounted on the bracket 85. One type of switch which may be conveniently employed is a double-pole, single-throw type which opens a first circuit and holds this circuit open while closing a second circuit and then opens the second circuit and recloses the first circuit. The two switch contacts are shown as 93 and 93a in Figure 16. The purpose of such a switch mechanism in a coin controlled drink vending apparatus is to prevent operation of the vending machine while this switch is operated for the purpose of advancing the stacks of cups on the supporting carriage. Further reference to the switch and switch controlling member will be made in describing the complete operation of the machine.

Reference is now made to Figures 8, 9, 10 and 11 in connection with the dispensing of an individual cup C for positioning beneath the pouring spout 94 which extends into a housing H through the back wall thereof from the refrigerating cabinet R of the vending machine. The cup receiving compartment is within the housing H which depends from the bridge member and has an open front wall to register with a suitable door controlled opening in the vending machine cabinet, the side and rear walls of the compartment being formed by an arcuate plate 95 which is cut away, as at 95a, to permit movement of the cup receiver 100, and the bottom being closed by a plate 99. Extending downwardly from the top and front of the compartment is an inclined wall 96 in the nature of a baffle which is recessed, as at 97, to extend around a guiding tube 98 for a dispensed cup. The upper end of the guiding tube 98 merges with a funnel-like guide 98a which serves to properly position the descending cup. The cup receiver 100, as more clearly shown in Figures 14 and 15, includes a vertical body portion 101 tapered to snugly fit the side of a cup and having inwardly directed arms 102, 102a at the top thereof and a countersunk portion 103 which provides a ledge 104 around the arms and body portion for the beaded edge of an individual cup. The countersunk portion 103, as shown in Figure 15, is curved according to the curvature of the cup and is of an extent to embrace about sixty per cent of the circumference of the cup. Below the arms 102, 102a of the receiver, the forward part of the body portion 101 of the receiver is well to the rear of the vertical center of the cup so that the cup can be securely grasped by the customer and readily removed from the receiver. This receiver 100 may be made of plastic or other suitable material and is carried by similar pairs of opposed levers 105, 106 which are pivoted at the tops thereof, as at 107, to the sides of the receiver 100 and at the bottoms thereof on rock shafts 108 beneath the bottom plate 99, the distance between the pivots 107 and the rock shafts being equal so that the pairs of levers 105, 106 form parallel parallelogram supports for the receiver. A bell crank lever 109 is pivoted to the housing, as at 109a, and each arm 110, 111 thereof is slotted as at 110a, 111a, respectively. The slot 110a in the arm 110 receives a pin 112 which is carried by a common core element 114 of two solenoids 115, 116 and the slot 111a in the other arm 111 receives a pin 117 which is carried by one of the levers 105. Thus, selective actuation of one of the solenoids 115, 116 will effect positioning of the receiver 100 in the cup receiving position of Figure 11 or with the cup beneath the dispensing spout 94, as shown in Figures 9 and 10. It is to be noted that the entire cup guiding and receiving mechanism is supported by the housing H which also supports the supporting bracket for the rock shafts. The hous-

ing is in the nature of a cell and the operating parts are hidden from view and unauthorized tampering by the arcuate wall or plate 95. Similarly, the baffle 96 assists in preventing tampering with the machine.

Reference is made to Figures 12 and 13 to show the connection between the magazines 51 and the horizontal top surface 48 of the carriage. The bottom end of each magazine is provided with a pair of spaced outwardly extending flanges 120, 121, the lower flange 121 having edge portions thereof cut away to provide outwardly extending lugs 122. The openings 50 in the top surface of the carriage are generally circular but are also provided with inwardly extending spaced lug surfaces 123. Thus, each individual magazine 51 may be inserted through a corresponding opening 50 and the upper flange 120 will support the magazine on the top surface 48 of the carriage. Slight rotation of the magazine will result in an interlocking of the spaced lugs 122, 123 around the opening 50 and on the bottom flange of each magazine. This readily releasable type of connection is of importance in servicing the machine when a new supply of cups is to be placed therein. Thus, if the machine is reached for service when there are two magazines completely empty but the third magazine still containing some cups, it is necessary to shift the carriage to the right, as viewed in Figure 1, in order to place the first magazine at the dispensing station. However, the column of cups still remaining in the third magazine prevents such movement of the carriage because these stacked cups extend into the cup dispenser. Thus, the entire column in the third magazine would ordinarily have to be elevated but such an operation is difficult because of the depth of the dispensing machine. By the above described simple form of releasable connection for the magazines at a point only slightly above the upper end of the cup dispenser, the attendant can easily separate the stack at the upper end of the dispenser leaving the cups therein undisturbed and slide the carriage to its starting position wherein the entire supporting structure can be swung outwardly and the other magazines refilled without difficulty, it being understood that the vending machine cabinet is provided with suitable removable or hinged sections permitting authorized access to the enclosed mechanism.

The wiring diagram showing the manner and sequence of operation is illustrated in Figure 16 to which reference is now made in connection with the operation of the machine. Reference is again made to my aforesaid copending application in which is shown a gang of switches operated by a plurality of cams. A similar gang of switches 130, 131, 132, 133 and the operating cams 134, 135, 136, 137, respectively, therefor are shown in Figure 16. A coin operated switch 138 of well known construction is closed by the insertion of a coin and this momentarily energizes a relay magnet 139 to close the switch 140. Simultaneously, the driving motor 141 for the cams is started and initially the motor switch 143 is closed by the cam 142 to keep the motor in operation to complete the cycle the cam 134 closes switch 130 to energize the solenoid 115 which shifts the bell crank lever 109 to the position of Figure 11 so that the cup receiver 100 is carried forwardly to cup receiving position by the levers 105, 106. Then the cam 135 closes the switch 131 to energize the solenoid 80 which shifts the arm 83 and the cup dispensing ring 77 with the cam rollers 78 away from the "ready" position of Figure 6 to effect the removal of an individual cup from the supply stack at the dispensing station. The released cup passes through the funnel 98a and guide tube 98 and comes to rest on the cup receiver 100 as shown in Figure 11.

After the cup is in position on the receiver, the cam 136 closes the switch 132 to energize the solenoid 116 which, through the bell crank lever 109 and the receiver supporting levers 105, 106, shifts the cup and the receiver 100 to the filling position of Figure 9 wherein the cup is disposed immediately below the pouring spout 94 and the dispensing circuits of the vending machine will effect discharge of a predetermined amount of beverage into the empty cup, at which time the door (not shown) of the removal opening in the cabinet will open to permit the filled cup to be grasped and removed by the customer. Of course, the cam 137 will have closed the switch 133 to energize the solenoid 81 which effects a positive resetting of the individual cup dispensing mechanism to the "ready" position of Figure 6 for a further dispensing cycle. The use of solenoid 81 for re-setting, instead of a return spring, has been found to be highly desirable in that the speed of action of the solenoid 80 is substantially increased when not acting against resistance, as in a spring. This increased speed of action in the cup dispensing action imparts a spin to the dispensed cup and this materially assists in locating the cup on the receiver.

Upon depletion of the cups in the magazine then at the dispensing station to a point where only four or five cups remain in the dispenser and the uppermost of these cups is below the arm 90 of the switch controlling lever 88, as shown by the dotted line positions of Figure 7, the arm 90 will be swung inwardly by the cam 84 and spring arm 91 during the previous dispensing of an individual cup. This movement of the lever 88 and the spring switch arm 91 will remove restraint from the switch button 92 (which is spring pressed outwardly) and initial outward movement of the button 92 will permit the switch 93a to open the vending machine circuit and close switch 93. The insertion of a coin will momentarily close switch 140 to energize the solenoid 74 (see Figures 1 and 2) which momentarily shifts the escape lever 69 in a clockwise direction. Thus, the arm 70a of the lever will be shifted below the pin 67 with which it had been in contact and the spring motor operates through the tape or ribbon 62 to pull the magazine carriage toward the left of Figures 1 and 2. This movement will advance a new stack of cups in the next magazine to the dispensing station where the arm 70a of the lever 69 will have been elevated, as previously pointed out, so that it will engage the next pin 67 and hold the magazine carriage in this advanced position for dispensing the new supply of cups.

The stack of cups from the replenished supply will drop into the cup dispenser to nest with the cups remaining therein and this movement of the stack will shift the lever 88 to the full line position of Figure 5, the lever 88 being faired, as at 88a, to facilitate nesting. The switch arm 91 will be similarly shifted to force the switch button 92 inwardly and set the switch for a subsequent stack replenishing cycle of operation, the operating circuits of the vending machine having been reclosed and switch 93 reopened. The intimate association of the control lever 88 with the cup dispensing mechanism and its posi-

tive actuation with each cup dispensing operation insures a positive response to depletion of cups in one magazine to a predetermined minimum so as to promptly effect advance of a further supply of cups.

In servicing the machine when all magazines are empty or when only one or more need refilling as previously pointed out, it is a simple matter for the magazine carriage to be shifted to starting position and the entire bridge member **30** swung outwardly about the pivot **23** upon removal of the pin **35**. This movement of the supporting bridge renders all parts of the dispensing and reloading mechanism immediately available for repair or the like. The magazines serve to maintain the cups free from dust and the like and the quick releasable connection between the individual magazines and the carriage is a convenient and time saving manner to replenish a partially consumed supply of cups by facilitating the rapid shifting of the carriage to starting position. Replacement of parts, when necessary, is greatly facilitated by the supporting assembly hereby provided. The invention presents a machine which is extremely simple in construction and assembly and one wherein the various parts thereof are readily accessible so that any servicing may be accomplished with a minimum expenditure of time and effort. The cup positioning mechanism is one wherein there is no danger of the cup striking the dispensing spout during its path of movement to the receiver and wherein the dispensed individual cup is accurately and securely held by the receiver during positioning beneath the spout and yet the cup may be readily removed by a customer.

While one form of the invention has been shown for purposes of illustration, it is to be clearly understood that various changes in the details of construction and arrangement of parts shown in the illustrated embodiment may be made without departing from the spirit and scope of the invention. The invention is, accordingly, not to be limited to the precise embodiment shown and described, but only as indicated in the following claims.

I claim:

1. In an article dispensing machine having a single dispensing station, the combination of a rectilinearly movable support for a plurality of stacks of articles to be dispensed, a dispenser mechanism located at the dispensing station and including a single combination of automatically operated shiftable article engaging means for dispensing an individual article from the stack then at the dispensing station, and means including a control element shiftable into contacting position with articles in said stack and operated by said article engaging means for moving said support to present a new stack of articles to said dispensing station upon depletion of the articles in the preceding stack below a predetermined minimum.

2. A dispensing machine for nested articles having a single dispensing station and comprising a rectilinearly movable support for a plurality of stacks of articles to be dispensed, a dispenser mechanism located at the dispensing station and including a single combination of automatically operated article engaging means for dispensing the lowermost individual article from the stack then at the dispensing station, means operable to advance said support to present a new stack of articles to said dispensing station upon depletion of the articles in the preceding stack below a predetermined minimum, and means including electromagnetic releasing means operatively connected with said article engaging means for selectively controlling advance of said support to present new stacks of articles to said dispenser mechanism.

3. A cup dispensing mechanism for a beverage dispensing machine comprising in combination a rectilinearly movable support for a plurality of stacks of nested cups, a single cup dispenser having means engageable with the cups in the stack available for dispensing for separating the lowermost cup therefrom, automatically operable actuating means for said cup dispenser, means for advancing said support to present a new stack of cups to said dispenser upon depletion of the supply in a previous stack, and means independent of said actuating means and operated by said cup dispenser for controlling advance of said support to present a new stack of cups to said cup dispenser.

4. A cup dispenser for a beverage dispensing machine, comprising in combination a movable support for a plurality of stacks of nested cups, a cup dispenser having rotatable and bodily movable elements for removing the lowermost cup from a stack of cups, means powered separately from said cup dispenser for advancing said support with a single motion to present a new stack of cups to the dispenser upon depletion of a previous stack, and means including a cam member associated and movable in unison with one of said elements for controlling advance of said support to present a new stack of cups to said dispenser.

5. A cup dispenser for a beverage dispensing machine, comprising in combination a movable support for a plurality of stacks of nested cups, a cup dispenser having rotatable and bodily movable elements for removing the lowermost cup from a stack of cups, means for advancing said support to present a new stack of cups to the dispenser upon depletion of a previous stack, cam means associated and movable in unison with one of said elements, a control lever associated with and responsive to movements of said cam means, an escape lever adapted to engage said support to prevent advance movement thereof but releasable from engagement therewith to permit advance of said support, and means responsive to movements of said control lever for selectively actuating said escape lever.

6. A cup dispenser for a beverage dispensing machine, comprising in combination a movable support for a plurality of stacks of nested cups, a cup dispenser having rotatable and bodily movable elements for removing the lowermost cup from a stack of cups, means for advancing said support to present a new stack of cups to the dispenser upon depletion of a previous stack, cam means associated and movable in unison with one of said elements, a control lever associated with and responsive to movements of said cam means, an escape lever adapted to engage said support to prevent advance movement thereof but releasable from engagement therewith to permit advance of said support, a solenoid for shifting said escape lever, and switch mechanism responsive to movements of said control lever for selectively controlling said solenoid.

7. A cup dispenser for a beverage dispensing machine comprising in combination a track supported carriage adapted for rectilinear movement, said track being mounted on a pivotable bridge support, a plurality of magazines supported on said carriage for holding a plurality of stacks of

nested cups, a cup dispenser located below said carriage and including means engageable with the cups therein for removing the lowermost cup from the stack, motor means for advancing said carriage to present a new stack of cups to the dispenser upon depletion of a previous stack, a plurality of projections on said carriage, said projections being predeterminedly located one with respect to each of said magazines, an escape lever mounted for pivotal movement between a position disposed in the path of said projections and a position clear of said projections, solenoid means for shifting said escape lever, a feeler arm associated with said cup dispenser and movable with said cup engaging means into and out of contact with the stack of cups during each cup dispensing operation, said feeler arm being adapted to move inwardly beyond the normal outer surface of the stack of cups upon depletion thereof to a predetermined minimum in said cup

dispenser, and a switch mechanism responsive to said latter movement of said feeler arm for controlling an electric circuit to said solenoid means whereby to selectively actuate the escape lever and permit advance of the next magazine over the cup dispenser.

WALTER VON STOESER.

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