United States Patent [19]

Knickerbocker

[11] **3,831,809**

[45] **Aug. 27, 1974**

[54] **SINGLE-VEND DISPENSING MACHINE**

[76] Inventor: **Karl Knickerbocker,** 400 Baycrest Dr., Venice, Fla. 33595

[22] Filed: **May 18, 1973**

[21] Appl. No.: **361,639**

[52] **U.S. Cl.** **221/227**

[51] **Int. Cl.** **B65g 59/02**

[58] **Field of Search** 221/227, 241, 251; 194/155, 51, 65, 59, 2, 10

[56] **References Cited**

UNITED STATES PATENTS

839,304	12/1906	Long	221/241 X
2,522,033	9/1950	Graham	221/251 X
2,984,326	5/1961	Westphal	194/59
3,136,451	6/1964	Deane	221/241 X
3,263,859	8/1966	Searle	221/227
3,318,478	5/1967	Hart	221/227

Primary Examiner—Stanley H. Tollberg
Attorney, Agent, or Firm—Stein, Orman & Fisher

[57] **ABSTRACT**

A single vend periodical dispensing machine configured for use with a coin operated mechanism for dispensing a single item during each cycle of operation. The dispensing machine includes a cabinet housing and periodical support means comprising an elevator platform, means, elevator lift means and elevator release means operatively disposed therein. The elevator release means engages the elevator lift means to relieve the pressure on the stack of periodicals being dispensed to prevent excessive pressure when in dispensing position to facilitate withdrawal from the machine through a dispensing opening. The dispensing machine also includes a thickness control means to control the size of the dispensing opening as the thickness of the periodical varies. In addition, a loading access door is pivotally attached to the top of the cabinet housing and arranged relative to the elevator platform means to permit leading of the periodicals thereon. A dispensing access door is pivotally attached to the front of the cabinet housing to permit withdrawal of the periodical through the dispensing opening. The loading access door houses a dispensing control means arranged relative to the dispensing opening to limit dispensing of a single item each cycle such that when the proper coins are inserted into the coin operated mechanism the dispensing door is released, unlocking the control means to dispense a periodical.

13 Claims, 10 Drawing Figures

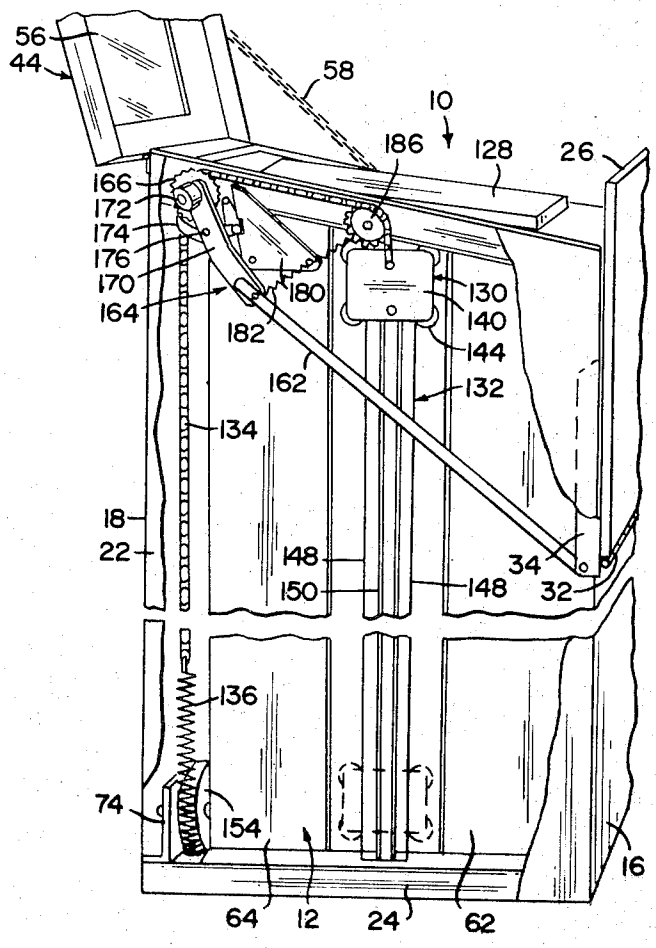


FIG. 1

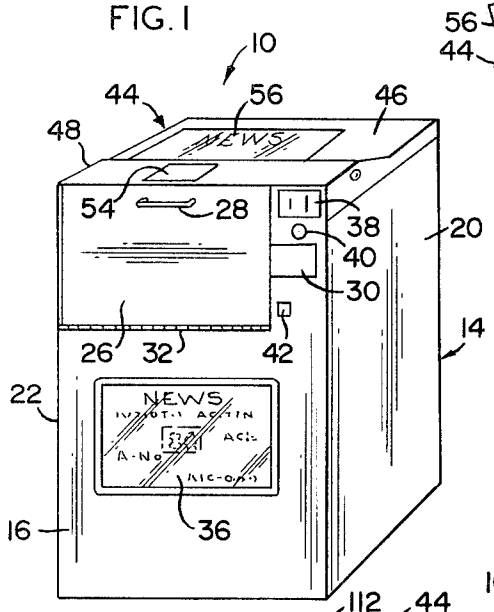
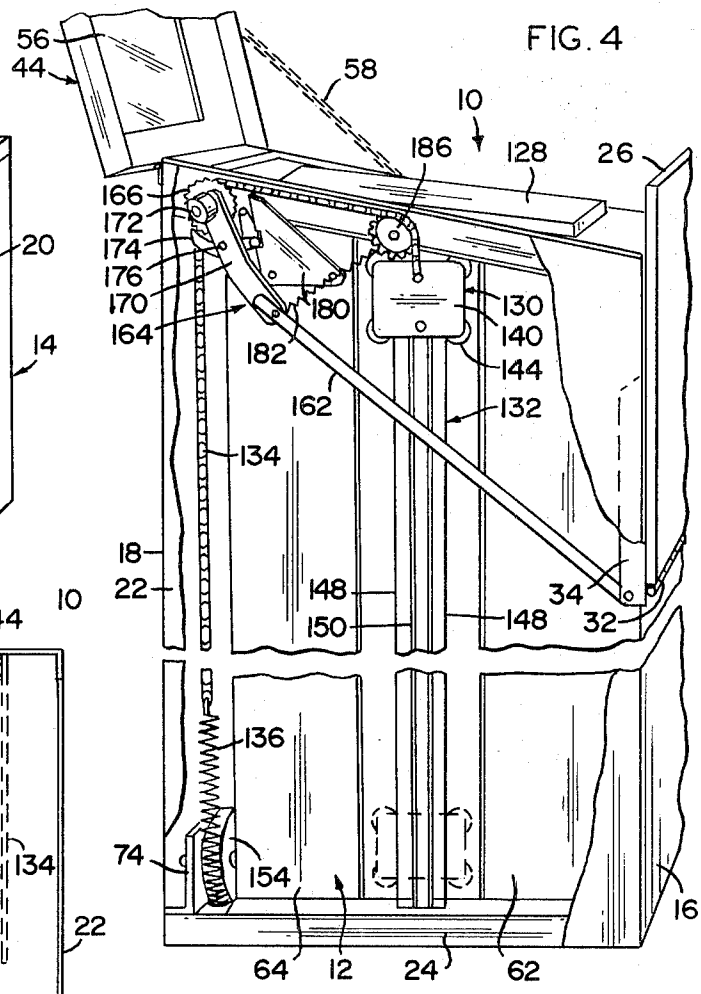


FIG. 4



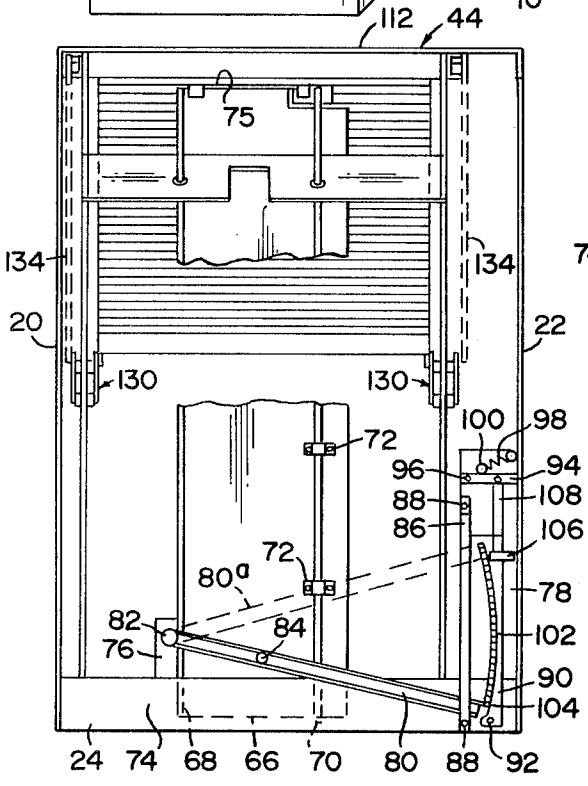


FIG. 2

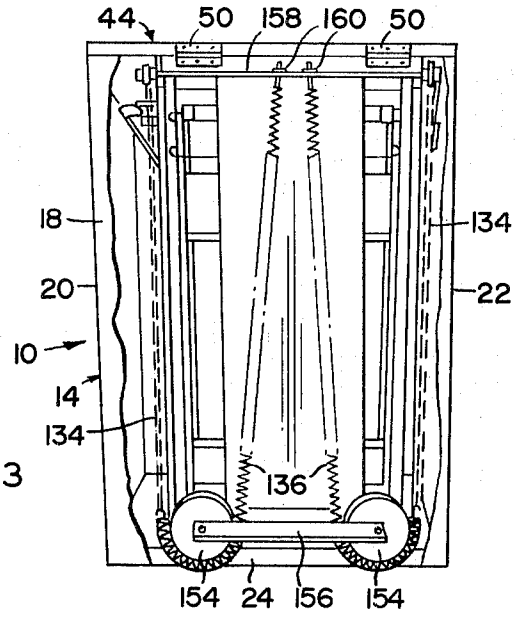


FIG. 3

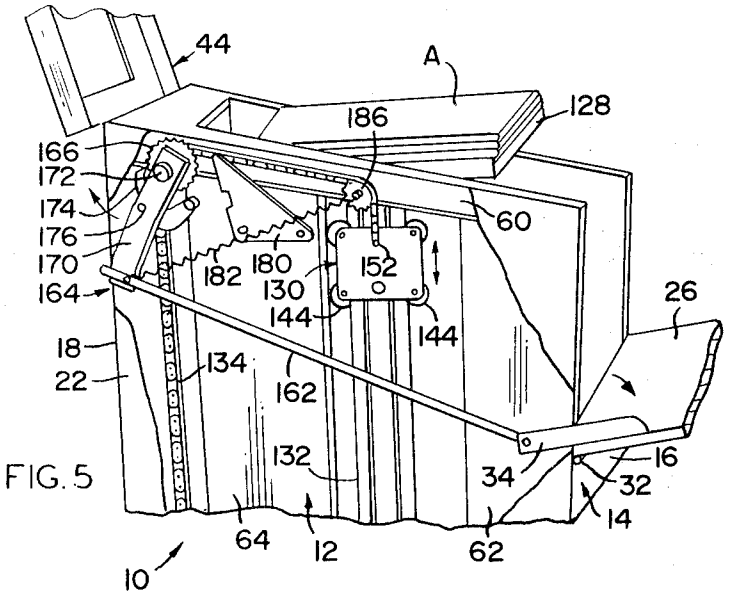
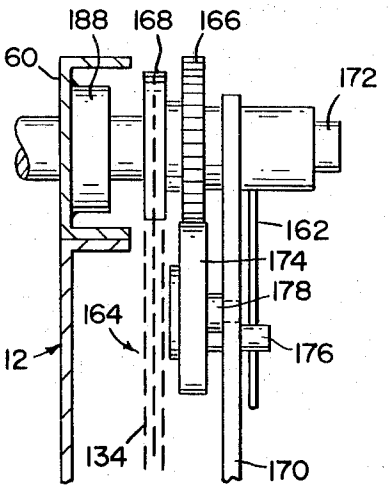


FIG. 5

FIG. 6



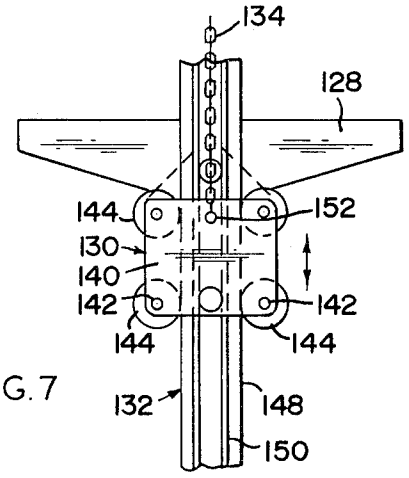


FIG. 7

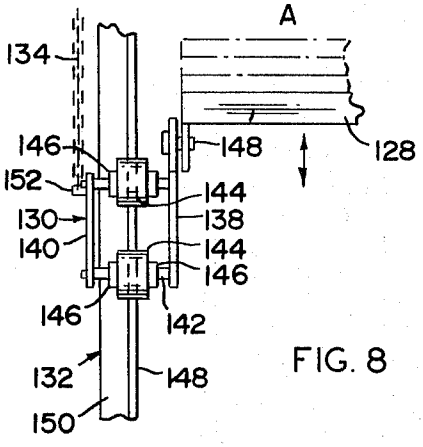


FIG. 8

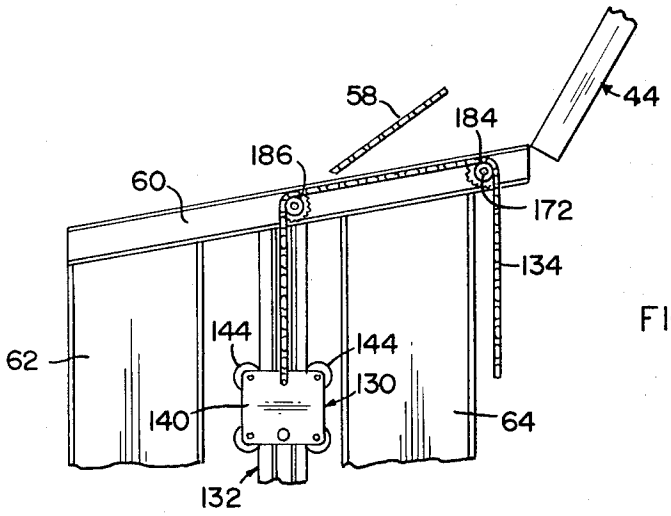


FIG. 9

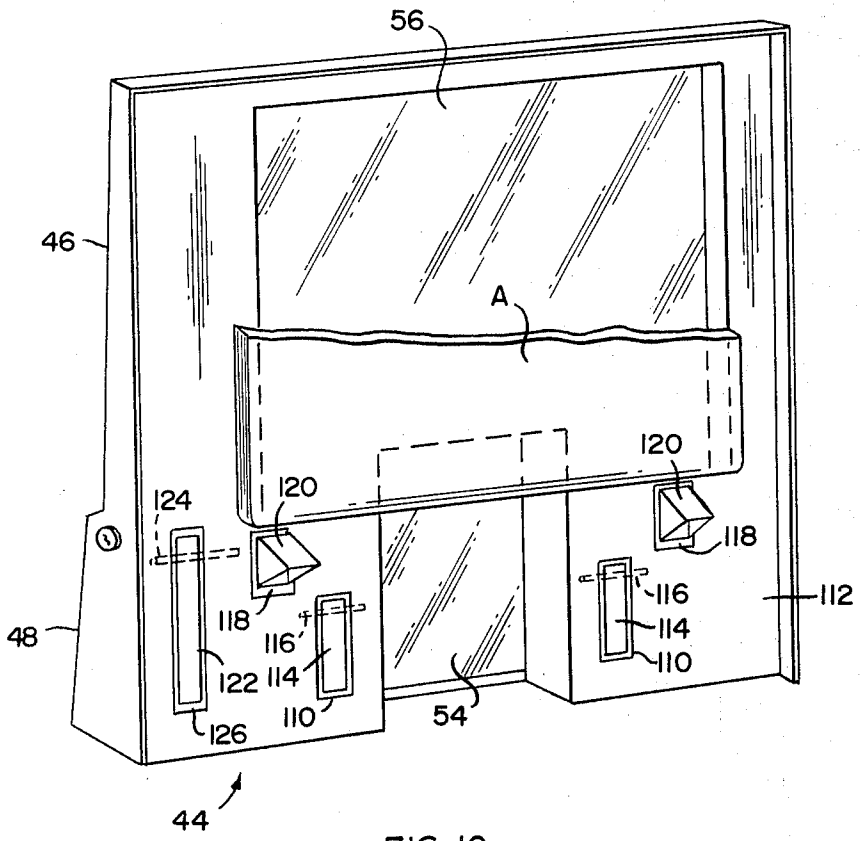

56
46
A
120
120
124
118
118
116
116'
114
114
110
110
112
48
122
126
54
44

FIG. 10

SINGLE-VEND DISPENSING MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a single vend periodical dispensing mechanism for dispensing newspapers, magazines, or the like, in such a manner that only a single newspaper or periodical is dispensed from the dispensing mechanism during each dispensing cycle when the proper coins are inserted into the coin operated mechanism.

2. Description of the Prior Art

A number of newspaper racks and the like have been developed to provide a means of vending such items without the necessity of an attendant.

The earliest type of rack comprises simple support type racks or structures. Although these racks were extremely inexpensive to manufacture and maintain, the items were generally exposed to the elements and easily pilfered without payment for the items.

The next generation of racks generally comprised enclosed coin operated vending machines. Since the items were commonly enclosed within a cabinet, they were protected from the elements. However, access into the cabinet during the dispensing cycle permitted removal of all the remaining items. Thus, even these coin operated vending machines were subject to pilfering.

More recently, various attempts have been made to develop single vend coin operated vending machines to permit dispensing only a single item during each operating cycle. These single vend machines may be characterized as either vertical or horizontal feed type devices. Unfortunately, the horizontal feed devices comprise complicated feed and actuating mechanisms which are expensive to both manufacture and maintain. On the other hand, the weight of the vertical stack of items in the vertical type feed device commonly necessitates the use of elaborate bias and release mechanisms which attendant costs of manufacture and assembly.

Thus, there is an obvious need for an inexpensive, highly reliable single vend newspaper/periodical dispensing machine.

SUMMARY OF THE INVENTION

This invention relates to a single vend periodical dispensing mechanism. More specifically, the dispensing mechanism comprises a support frame having a cabinet housing attached thereto to house a vertical stack of newspapers or other periodicals to be dispensed. A dispensing access door and loading access door are pivotally attached to the front and top of the cabinet housing respectively, as more fully described hereinafter.

A periodical support means is movably mounted on the support frame to position the periodicals in the dispensing position. The periodical support means comprises a substantially horizontal elevator platform means to support the stack of periodicals, elevator lift means coupled to support the frame to operatively position the stack of periodicals relative to a dispensing opening for dispensing and elevator release means to permit dispensing of the periodicals.

The dispensing machine includes a thickness gauge means arranged relative to the support frame to vary the size of the dispensing opening to permit withdrawal of a single periodical during each dispensing cycle. The dispensing machine also includes a dispensing control means including locking means to limit withdrawal of a single periodical during each cycle.

In operation, the periodical support means acting on the stack of newspapers or periodicals within the cabinet housing forces the uppermost periodical in the stack into dispensing alignment relative to the dispensing opening. When the dispensing access door is swung open, the top newspaper or periodical in the cabinet is released for dispensing or removal by the elevator release means. The elevator release means relieves the tension on the stack of periodicals to prevent excessive pressure on the periodical in dispensing position to permit free and easy withdrawal from the mechanism while at the same time exerting sufficient pressure to always maintain the uppermost periodical in the dispensing position.

When the top newspaper or the like is removed from the cabinet, all remaining newspapers are locked in the cabinet housing by the dispensing control means. Thereafter, a new cycle, starting with the insertion of the proper combination of coins to release the paper dispenser door for the dispensing or withdrawal of additional newspapers, is required.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

FIG. **1** is a perspective view of the dispenser cabinet.

FIG. **2** is a cross-sectional front view of the dispenser cabinet.

FIG. **3** is a cross-sectional rear view of the dispenser cabinet.

FIG. **4** is a partial cut-away view showing the dispenser cabinet interior.

FIG. **5** is a detailed cross-sectional side view of the dispenser cabinet.

FIG. **6** is a detailed view in partial section of the pressure relief mechanism.

FIG. **7** is a detailed view of the elevator platform guide.

FIG. **8** is a detailed end view of the elevator platform guide.

FIG. **9** is a partial side view of the dispenser cabinet.

FIG. **10** is a detailed view of the dispensing control means.

Similar reference characters refer to similar parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As best shown in FIGS. **1** and **4**, the present invention comprises a dispensing machine generally indicated as **10** including a support frame **12** and cabinet housing **14** attached thereto. The cabinet housing **14** includes front and rear walls **16** and **18** respectively and side walls **20** and **22** respectively held in fixed position relative to

each other by rectangular base **24.** Dispensing access door **26** including handle means **28** and door extension **30** is pivotally attached to front wall **16** by hinge **32.** Dispensing access door **26** is normally biased to the closed position by closing springs (not shown) such that door extension **30** engages front wall **16** (FIG. **1**). Release actuating means comprising member **34** is attached to dispensing access door **26.** A transparent display window **36** may be formed on front wall **16.** Also formed in front wall **16** are coin receiving means **38,** coin return actuator **40** and coin return receiver **42.** Loading access door **44** comprising a substantially flat horizontal rear portion **46** and enlarged forward portion **48** to house a dispensing control means, to be more fully described hereinafter, is pivotally attached to upper portion of rear wall **18** by hinges **50** (FIG. **3**). Loading access door lock **52** is also housed within enlarged forward portion **48** to lock loading access door **44** closed. Guide opening **54** and transparent newspaper display window **56,** as more fully described hereinafter, are formed in loading access door **44.** A limit means comprising a flexible chain **58** is interconnected between loading access door **44** and side wall **20** (FIG. **4**) to limit the movement of door **44** relative to cabinet housing **14.**

As best shown in FIGS. **4** and **5,** the support frame **12** comprises upper rectangular member **60** and base **24** held in fixed position relative to each other by forward and rear side panels **62** and **64** disposed on either side of cabinet housing **14.**

FIG. **2** is a front view of the dispenser cabinet with front wall **16** removed to show the thickness control means similar to that described in my patent application Ser. No. 3,623 filed 1-19-1970.

The thickness control means includes a vertically disposed rectangular channel **66** having stiffeners **68** and **70** rigidly secured thereto by brackets **72.** Channel **66** and stiffeners **68** and **70** are rigidly secured to horizontal channel **74** attached to base **24.** Rod **70** may be adjusted to overcome inaccuracies encountered in manufacturing, obtaining an even dispensing opening means **76** cooperatively formed between the top of the thickness control means and the bottom of loading access door **44.** Since the purchaser manually withdraws the periodical through this opening **76** it is important that this opening **76** be adjustable to a height that will permit the withdrawal of only one periodical at a time.

The thickness control means also includes a thickness actuating assembly comprising horizontal channel **74,** vertical angle section **76** and vertical angle section **78.** One end of walking beam **80** is pivotally attached to vertical angle section **76** by fastener **82.** Walking beam **80** is also pivotally connected to channel **66** by fastener **84.** The opposite end of walking beam **80** is held against vertical angle section **78** by guide strap **86.** The upper and lower ends of strap **86** are secured to vertical angle section **78** by fastners **88.** Space bushings (not shown) located between vertical angle section **78** and strap **86,** provide space for the accurate travel of walking beam **80.** The walking beam **80** is shown in phantom as **80***a* in the locked position. Index plate **90** is pivotally mounted at the lower end of vertical angle section **78** by fastener **92** while the top end is held in position by retainer strap **94** secured to vertical angle section **78** by fasteners **96.** Spacer bushings (not shown) located between vertical angle section **78** and retainer strap **94** provide space for the swinging movement of the top end of index plate **90.** Expansion spring **98** has one end secured to tab **100** formed on index plate **90** and the opposite end secured to vertical angle section **78** to swing clockwise away from walking beam **80.** Index plate **90** includes a plurality of locking teeth **102** for locking walking beam **80** by cooperative engagement of tongue **10** formed on walking beam **80** between teeth **102** to lock channel **66** in the desired position. Index plate **90** is held in position by member **106,** which is swingably mounted to vertical angle section **78.** Member **106** is interconnected to a lock means (not shown) by an actuating linkage **108** to move index plate **90** between locked or unlocked position. The lock means may be unlocked by actuating linkage **108** to allow member **106** to move upward away from index plate **90** permitting clockwise movement of index plate **90** to disengage tongue **104** of walking beam **80** from teeth **102** to adjust channel **66.**

To operate the thickness control means so that only one periodical can be withdrawn from dispensing machine at a time, the operator unlocks lock means to free index plate **90,** freeing the thickness actuating assembly for adjustment. The operator then manually pulls the top periodical forward several inches. To adjust the width of the dispensing opening **72** the operator manually raises channel **66** upward until the top end presses against the bottom of the partially pulled out periodical, then locks the entire assembly in position. With the thickness control means in the locked position, the dispensing opening **72** is just wide enough to allow withdrawal of a single periodical.

FIG. **10** is a perspective view of the bottom of loading access door **44** showing a portion of the dispensing control means. As previously described, loading access door **44** comprises enlarged forward portion **48** and horizontal flat rear portion **46.** A pair of substantially rectangular apertures **110** are formed on the bottom **112** of door **44** on opposite sides of guide opening **54.** A pair of tripping plates **114** pivotally mounted on shaft **116** are arranged to operatively extend through apertures **110.** As more fully described hereinafter, a second pair of substantially rectangular apertures **118** are formed in bottom **112.** A pair of locking plates **120** are arranged to operatively extend through apertures **118.** The dispensing control means further includes a reset means comprising reset plate **122** interconnected to locking plates **120** by reset plate shaft **124** and aperture **126.**

As shown in FIG. **10,** the uppermost paper A in the dispensing portion is disposed to engage and actuate the dispensing control means. To operate, paper A is manually withdrawn from cabinet **14** through opening **72** (FIG. **2**). Tripping plates **114** normally extend outward through apertures **110** in front of the uppermost paper A. As the paper A is withdrawn, tripping plates are cammed inwardly and out of the path of the paper A moving locking plates **120** across dispensing opening **72** to prevent removal of additional papers. When the proper coin or combination of coins is inserted in the coin mechanism, dispensing access door **26** is unlatched, allowing door **26** to be swung open to paper access position. When door **26** is opened, reset plate **124** is actuated causing locking plates **120** to swing from the paper lock-in position across the paper removal opening **72,** and come to rest in unlocked position and extend tripping plates **114** to allow authorized removal of a paper from the dispenser machine **10.**

As best shown in FIGS. 4 and 5, the periodical support means comprises a substantially horizontal elevator platform means 128, elevator guides 130, elevator guide rails 132, ladder chain 134 and elevator lift springs 136.

As best shown in FIGS. 7 an 8, elevator guides 130 comprise inner and outer plates 138 and 140 respectively held in substantially parallel relation to each other by connecting rods 142 disposed at each of the four corners. Rotatably mounted on each of the connecting rods 142 is guide roller 144 held in spaced relation to plates 138 and 140 by spacers 146. Inner plate 138 is fixedly attached to elevator platform means 128 by stud 148. An elevator guide rail 132 extends vertically on either side of the frame between base 24 and upper side frame member 60. Guide rails 132 comprise a substantially flat bar 148 with stiffener channels 150 extending the length thereof. The width of bar 148 relative to the horizontal separation of rollers 144 is such that rollers 144 engage opposite sides of bar 148 to guide the vertical movement of the elevator platform means 128. One end of ladder chain 134 is coupled to elevator means by stud 152 and at the opposite end to elevator lift spring 136.

As best shown in FIG. 3, periodical support means further includes idler rollers 154. Elevator lift springs 136 operatively engage idler rollers 154 and are fastened to the frame by interconnecting shaft 158 by fastening means 160.

As best shown in FIGS. 4 through 6, the actuating means comprises actuating linkage 162 and elevator release means generally indicated as 164. The purpose of the elevator release means 164 is to relieve the upward pressure exerted between the elevator platform means 128 with the periodicals stored thereon and the bottom 112 of door 44 by elevator lift springs 136. Elevator release means 164 comprises ratchet 166, drive sprocket 168 and crank means 170 mounted to frame member 60 by interconnecting shaft 172. A ratchet pawl 174 is mounted on crank means 170 by mounting stud 176 and held in spaced relation thereto by spacer 178. The outer end of mounting stud 176 is operatively coupled to door extension 34 by actuating linkage 162 (FIG. 5). Elevator release means 164 further includes camming plate 180 attached to side panel 64. Camming plate 180 is interconnected to crank means 170, by spring 182 to normally bias elevator release means 164 to the forward most position (FIG. 4) such that pawl 174 engages plate 180 to cam pawl 174 out of engagement with ratchet 166. An idler sprocket 184 similar to drive sprocket 168 is mounted on the opposite end of interconnecting shaft 172 which extends the width of the cabinet 14 (FIG. 9). In addition, a pair of idler sprockets 186 are mounted on opposite sides of upper frame member 60. The outer end of shaft 172 is mounted on bearing 188 (FIG. 6).

Normally, pawl 174 is held out of operative engagement with ratchet 166 by plate 180. To operate, dispensing access door 26 is pivoted open causing linkage 162 to move rearwardly rotating crank means 170 to revolve clockwise about shaft 172. As crank means 170 rotates clockwise, pawl 174 engages ratchet 166 causing shaft 172 to rotate clockwise. As shaft 172 rotates clockwise, drive sprocket 168 rotates pulling ladder chain 134 upward allowing elevator platform means 128 to move downward to relieve the pressure created by elevator shaft springs 136. Since idler sprocket 184 is coupled to shaft 172, the opposite ladder chain 134 is simultaneously drawn upward relieving pressure on the opposite side of elevator platform means 128. As dispensing access door 26 is returned to the normally closed position, pawl 174 is cammed out of engagement with ratchet 166 allowing elevator lift springs 136 to elevate elevator platform means 128 upward to move the upper most periodical A in dispensing position relative to dispensing opening means 72.

To load, the operator opens loading access door 44 and removes unsold periodicals, if any, and reloads the dispensing machine 10 with the current issue by placing the periodicals on the elevator platform means 128. The elevator platform means 128 and the periodical slope thereon, is forced downward as the periodicals are loaded will maintain the desired down position and facilitate the unobstructed loading of additional periodicals.

After loading, the loading access door 44 is closed and locked to prevent unauthorized removal of the periodicals therefrom.

With the dispensing access door 26 opened, the operator adjusts the thickness control means as previously described. Once the dispensing access door 26 is closed, the machine is ready for normal operation.

To operate, the proper selection of coin is inserted into the coin receiving means 38 which permits the opening of dispensing access door 26. As previously described, as the door is opened the actuating means relieves the upward pressure exerted by the elevator lift springs 136 permitting withdrawal of the uppermost periodical. It should be noted that guide aperture 54 permits the insertion of a hand below the enlarged portion 48. As the upper most periodical is withdrawn from the dispensing machine 10 the dispensing control means locks the remaining papers in place as previously described. As the dispensing access door 26 is returned to a normally closed position, all remaining periodicals are locked in the cabinet housing 14. Thereafter, a new cycle starting with the insertion of the proper combination of coins repeats the process.

It will thus be seen that the objects made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing, shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Now that the invention has been described,

What is claimed is:

1. A single vend periodical dispensing machine primarily designed for use with a coin operated mechanism mounted thereon, said dispensing machine comprising a support frame, a cabinet housing attached thereto, said cabinet housing comprising an enclosure to house periodicals to be dispensed and access means to permit withdrawal of periodicals from said cabinet housing, elevator platform means movably mounted on said support frame in supporting relation to periodicals to be dispensed, dispensing opening means arranged above said support means to limit withdrawal of period-

icals through said access means, positioning means disposed to engage said elevator platform means to position periodicals in communicating relation with said dispensing opening means, said positioning means comprising at least one bias means interconnected between said support frame and said elevator platform means, said bias means disposed relative to said support frame and elevator platform means to bias the periodicals between said elevator platform means and said cabinet housing, said one bias means comprising an expansion spring mounted on a roller means rotatably attached to said support frame, dispensing control means disposed in engageable relation to a periodical being dispensed and in communicating relation to said dispensing opening means whereby the withdrawal of periodicals through said dispensing opening is controlled.

2. The periodical dispensing machine of claim **1** further including adjustment means attached to said dispensing opening means to control the size of said dispensing opening.

3. The periodical dispensing machine of claim **1** wherein said access means comprises a dispensing access door pivotally attached to said cabinet housing.

4. The periodical dispensing machine of claim **1** wherein said support means comprises an elevator platform means disposed substantially perpendicular to the longitudinal axis of said cabinet housing.

5. The periodical dispensing machine of claim **1** wherein said roller means is rotatably attached to the lower portion of said support frame, said expansion spring attached at one end to a portion of said support frame and at the opposite end to said elevator platform means, a flexible interconnecting means disposed to interconnect the opposite end to said elevator platform means, said expansion spring disposed to engage said roller means along the mid-portion thereof to form a substantially U-shaped contour in said expansion spring.

6. The periodical dispensing machine of claim **1** wherein said positioning means further includes release means in operative engagement with said bias means, said elevator platform means movably mounted relative to said cabinet housing by means of said bias means whereby removal of a periodical from said dispensing opening is permitted.

7. The periodical dispensing machine of claim **6** wherein said release means comprises a first sprocket means, sprocket actuating means operatively attached to said support frame, said first sprocket means arranged to engage said bias means and said sprocket actuating means interconnected to said access means, said sprocket actuating means disposed in engageable relation with said first sprocket means to move said elevator means whereby dispensing of a periodical from said dispensing machine when said dispensing access means is open relative to said cabinet housing is accomplished.

8. The periodical dispensing machine of claim **7** wherein said sprocket actuating means comprises a ratchet means coupled to said first sprocket means and pawl means pivotally fixed to an actuating member, said ratchet means movably disposed to move into and out of operative engagement with said sprocket means upon movement of said cabinet housing.

9. The periodical dispensing machine of claim **8** wherein said release means further includes cam means affixed to said frame and bias means connected between said cam means and said actuating member such that said pawl is operatively disengaged from said ratchet when said access door is closed relative to said cabinet housing and in operative engagement with said ratchet rotating said sprocket means relative to said support frame to move said elevator platform means relative to said cabinet housing and said dispensing opening means to permit dispensing a periodical.

10. The periodical dispensing machine of claim **9** wherein said support frame comprises an upper and lower support member held in fixed position relative to each other by rigid interconnecting members and wherein said dispensing machine further includes a pair of substantially parallel guide rails attached to opposite sides of said upper and lower support members, said elevator platform means includes a pair of elevator guides attached to opposite sides thereof, each said elevator guides disposed to engage one of said guide rails to guide the vertical movement of said elevator platform means.

11. The periodical dispensing machine of claim **10** wherein each of said elevator guides comprises at least two guide rollers held in fixed spaced relation to each other by a cross member, said spaced relation being such that said rollers engage opposite sides of said guide rails.

12. The periodical dispensing machine of claim **11** wherein said release means includes a second sprocket means attached to said support frame in substantially the same vertical plane relative to said first sprocket means, said second sprocket means arranged relative to said guide rollers to control the vertical movement of said guide rollers to control the vertical movement of said elevator platform means.

13. The periodical dispensing machine of claim **4** wherein said cabinet housing includes an opening in the top thereof and further includes a loading access door pivotally attached to said cabinet housing, to permit access to said cabinet housing through said opening, said loading access door arranged relative to said periodical support means whereby periodicals are loaded onto said periodical support means when said loading access door is open relative to said housing.

* * * * *