March 17, 1964 K. KNICKERBOCKER 3,125,247

DISPENSING APPARATUS

Filed Dec. 2, 1960 5 Sheets-Sheet 1

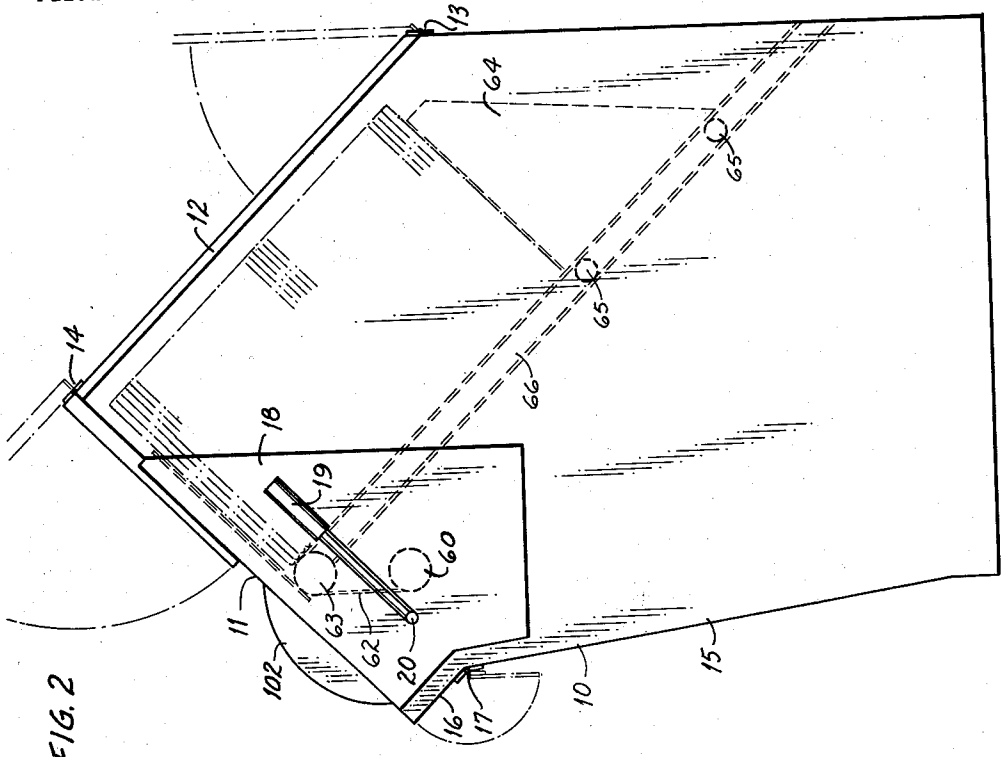


FIG. 2

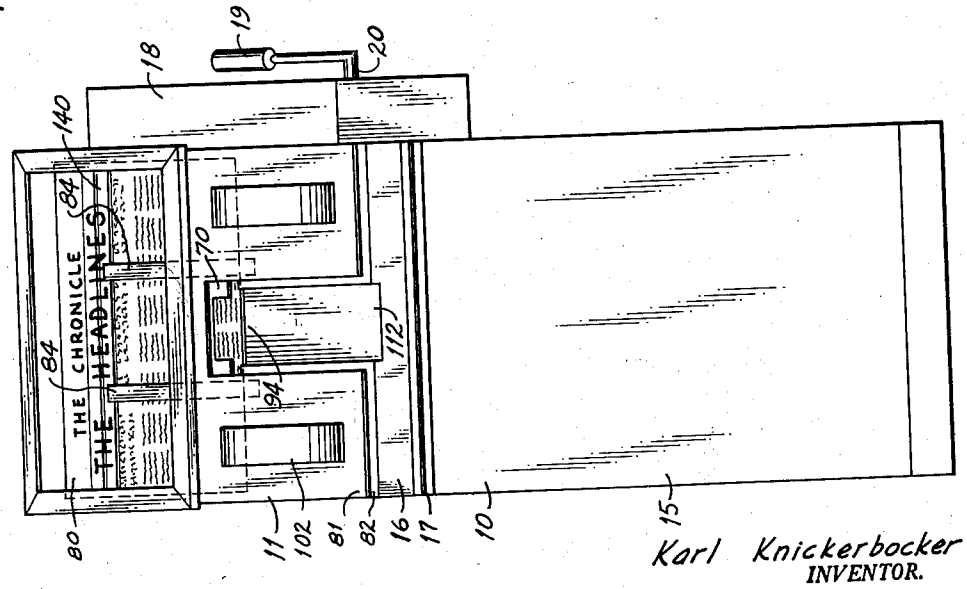


FIG. 1

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FIG. 3

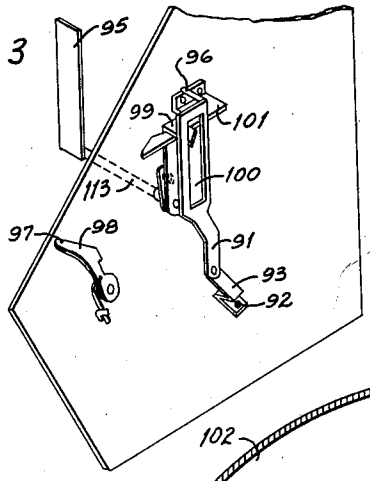


FIG. 4

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FIG. 5

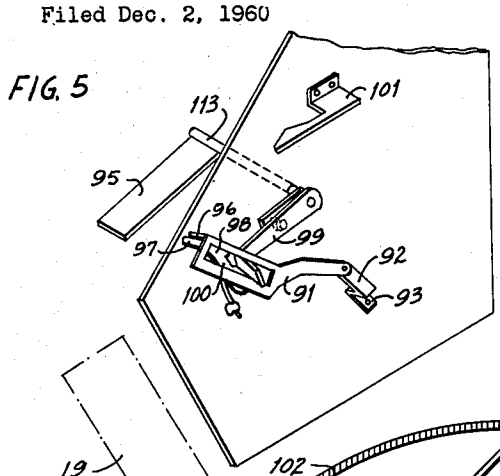


FIG. 6

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FIG. 7

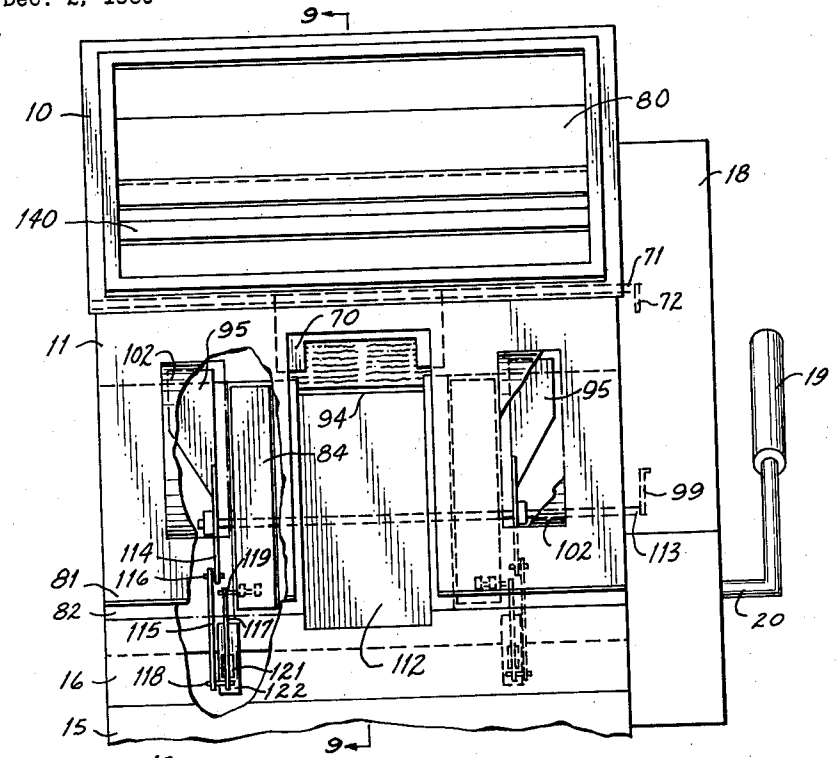
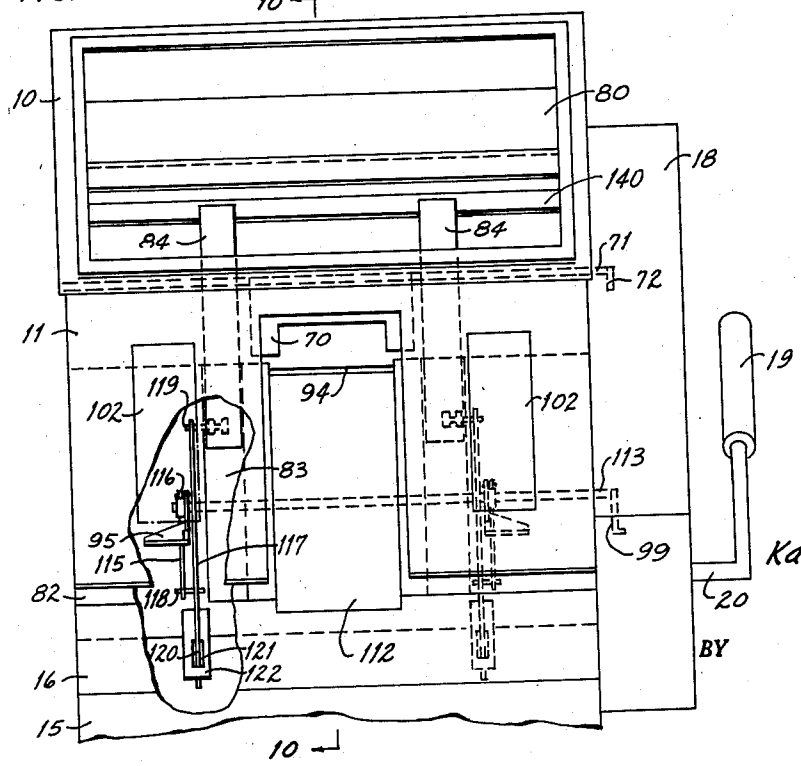


FIG. 8



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FIG. 9

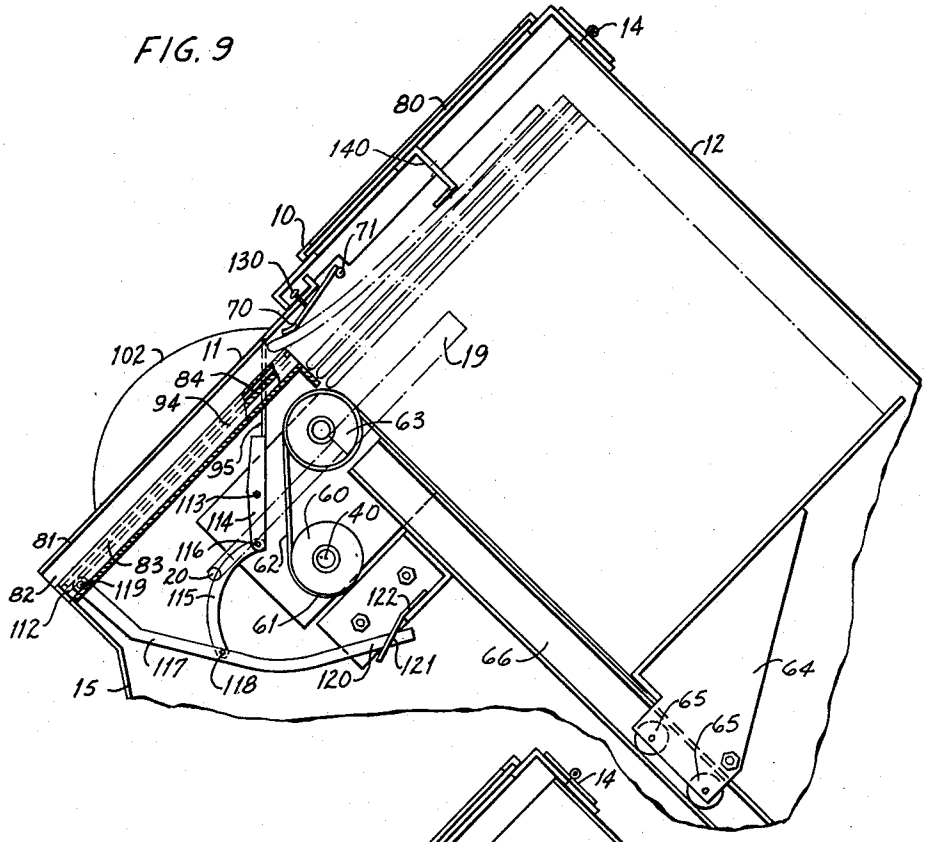
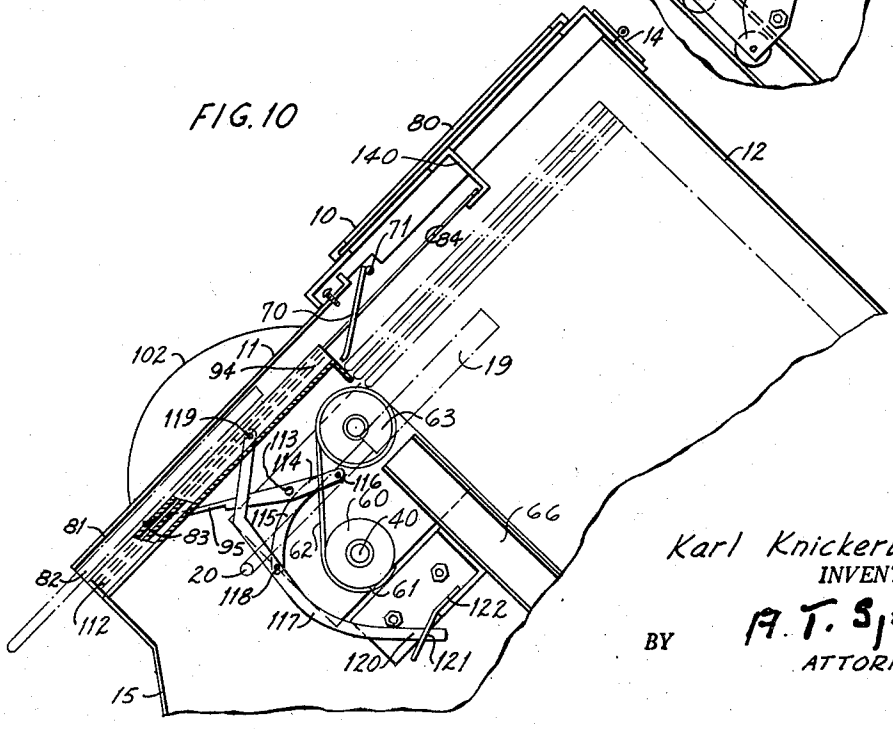


FIG. 10



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United States Patent Office 3,125,247 Patented Mar. 17, 1964

3,125,247

DISPENSING APPARATUS

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Filed Dec. 2, 1960, Ser. No. 73,318
5 Claims. (Cl. 221—279)

This invention relates to dispensing apparatus. While certain aspects of the present inventive concept may be broadly applicable in various types of dispensing means, the invention, as here shown by way of example, is more particularly concerned with the individual dispensing of newspapers, or like generally thin, flat objects and materials. Further, as here presented, the device is designed for coin or check control. However, since the present invention is not concerned with the detailed mechanism of any particular coin or check control device, such means is not here presented in detail.

One of the many problems with respect to individual newspaper dispensing, as in a vending machine, not heretofore satisfactorily solved, is provision of means permitting the ready authorized withdrawal of a single paper while precluding unauthorized removal of other papers. In the present invention this problem is solved by the provision of an automatically actuated valve plate movable in response to the authorized withdrawal of a paper to position the valve in the path of succeeding papers, thus precluding further paper withdrawal until the actuating mechanism is again brought into action as authorized by the insertion of the proper coin or check in the control mechanism.

Another problem confronting the designers of such devices, is that of convenient bulk loading and the individual presentation of papers for authorized withdrawal. In the present invention this problem is solved by an adequate door arrangement which may be operated to fully expose the interior and facilitate the deposit of an adequate supply of papers. The invention also provides conveyor means automatically operable to successively present succeeding papers of a stack for individual manual authorized removal while precluding the danger of mutilization either in the servicing of the papers for withdrawal or in their withdrawal.

A further feature of the present invention is the presentation of papers for vending by which they are exposed to view showing the headlines, banner, features and the like, but yet retaining the paper against unauthorized withdrawal. Numerous other objects, features and advantages of the present invention will be apparent from the consideration of the accompanying drawings taken in connection with the detailed specification.

In broad general terms, the present embodiment of the inventive concept may be defined as including a cabinet with an enclosing structure readily openable to accept a substantial stack of conventional newspapers. In the form of the invention the stack is supported on a conveyor belt by which the entire stack may be moved toward the dispensing outlet in progressive step by step procedure without damage or mutilation to the papers. The operating mechanism includes a manually operable lever, preferably coin or check released, by which the papers are moved by the conveyor forwardly to a position where the first paper of the stack is positioned for manual manipulation for withdrawal. Such withdrawal of the paper resets a retaining valve so as to preclude the withdrawal of further papers without authorization by the actuation of the lever. Another important feature of the invention is the provision of means whereby the conveyor actuation under the influence of the manual lever is so limited as to preclude excessive conveyor movement, hence establishing a movement readily controlled as to paper thickness. Thus, while one edition may be of one thickness, a readjustment of the device to conform with

the thickness of other editions is not required. From the following detailed description of the mechanism, it will be further apparent that through linkage and ratchet mechanism the device provides simple, effective and efficient mechanism for the individual dispensing under coin control of newspapers or like material. It will further be seen that the mechanism insures against the unauthorized distribution of papers, and further provides an arrangement not only durable and free of the danger of maladjustment, undue wear and deterioration, but one highly suited to the demands of economic manufacture.

In the drawings:

FIG. 1 is a front plan view of one embodiment of the invention here presented by way of illustration,

FIG. 2 is a side elevation of that form of the invention presented in FIGURE 1,

FIG. 3 is a detail of parts of the paper slide locking latch shown in paper release position,

FIG. 4 is a fragmentary side elevation of the operating mechanism,

FIG. 5 is a detail similar to FIGURE 3 showing the latch locking mechanism in delatching position,

FIG. 6 is a side elevation of the operating mechanism shown with the operating handle in forward position,

FIG. 7 is a fragmentary front elevation showing the valve locking mechanism in released position and ready for the delivery of the paper,

FIG. 8 is a similar view showing the position of the parts after the dispensing of a paper,

FIG. 9 is a fragmentary sectional view taken on the line 9—9 of FIGURE 7, and

FIG. 10 is a similar sectional view taken on the line 10—10 of FIGURE 8.

Referring to FIGURES 1 and 2, it will be seen that the present invention is here embodied in a cabinet generally indicated by the numeral 10, having an inclined paper display and discharge front 11. While the base of the cabinet is here shown as being of rectangular form, there is provided an upper forwardly inclined wall 12 hinged at 13 to the upper end of the rear wall of the cabinet. Hingedly secured as at 14 is the inclined front face 11, with respect to which reference will be made as to structural detail hereinafter. The front 15 of the cabinet is also here shown as forwardly inclined and terminates with an upper lip 16 hinged as at 17. This arrangement is such so as to permit the lip to be moved to hinge outwardly to facilitate inspection, adjustment or repair while both the front 11 and the rear wall 12 may be hinged to fully expose the interior of the cabinet for the reception of a quantity of newspapers.

At the side of the cabinet there is mounted an operating mechanism enclosure 18 from which extends the operating handle 19 on its shaft 20.

Referring more particularly to FIGURES 4 and 6, the operating mechanism of the present form of the device includes a camming plate 21 fixed to the shaft 20 of the operating lever 19, which plate together with the shaft and lever is normally retained in inoperative position and against movement by coin or check control latch 22, which may be released upon the insertion of the proper coin or check through a rod 23. Since the present invention is not concerned with the coin or check control mechanism, suffice to say that upon the insertion of the proper coin or check the rod 23 will be actuated to release latch 22 to free the cam plate 21 for movement in response to movement of the handle.

The normal inoperative position of the handle 19 as indicated by the dotted lines in FIGURE 4, is in a reverse position rearwardly inclined with respect to the cabinet. Upon release of the cam plate by the insertion of the coin, the handle is brought forward rotating the shaft 20 in counter-clockwise direction and therewith moving the

cam plate in the same counter-clockwise direction. A conventional full stroke spring urged pawl 24 is provided which may engage the ratchet teeth 25 on the lower segment of the cam plate to insure a full stroke of the handle and the cam plate before a return movement of the cam plate to its normal neutral position, as illustrated in FIGURE 4. On the upper quadrant of the cam plate 21 there is provided a lever camming slot 26 which receives the cam slot follower 27 of an actuating lever 28. The lever 28 extends outwardly and upwardly from the cam plate to be pivotally engaged as at 29 with a conveyor actuating link 30. The lever 28 however, extends beyond the pivotal point 29 to be pivotally engaged as at pivot 31 with a slide bar 32 engaged by a spring 33 mounted on a spring bracket 34; the spring 33 is merely a cushioning spring limitedly slidable with respect to bracket 34 to retard terminal movement of the slide bar 32. A releasably pivoted bell crank latch arm 35 pivoted at 35A on a transverse rod 35B normally holds the slide in its forward position as shown in FIGURE 4, with the slide 32 thus retained in the forward position by the hook 35C at the free end of the bell crank, the operating lever 28 will pivot on the plate 32 as the cam plate will move under the influence of the lever 19 and the shaft 20. In such pivotal movement with respect to the plate 32, a clockwise movement of the lever 28 induces an outward movement of the link 30. While the outer end of the link 30 is pivotally connected as at 29 with the lever 28, the opposite inner end of the link 30 engages an operating ratchet segment 36 loosely mounted on shaft 40 to which is pivotally secured as at 29A in the manner of the pivotal connection 29 at the other end of the link at 30 referred to above. A ratchet pawl 37 normally engages the ratchet teeth 38 of a conveyor shaft ratchet 39 fixed to shaft 40. It will be noted from the drawings that the ratchet segment 36 and the ratchet wheel 39 are coaxially mounted on a shaft 40 while the initial movement of the handle rotating the shaft 20 in counter-clockwise rotation pivots the lever 28 with respect to the slide 32 in clockwise movement because of the fixed position of the plate 32. Thus moving the link 30 to actuate the segment 36 it may be seen that upon release of the plate 32 by the crank arm 35 the forces exerted upon the lever 28 will move the slide 32 rearwardly against the tension of the spring 33 causing the lever 28 to pivot on the pivotal mounting 29 at the forward end of the link 30, thus terminating forward movement of the link 30 and movement of its connected ratchet support and further drive for the conveyor shaft 40 through the ratchet wheel 39. Such pivotal movement having been transposed from the fulcrum 31 of the plate 32 to the fulcrum 29 of the link 30, not only terminates the movement of the conveyor shaft 40 but at the same time a locking bell crank pawl 41, pivoted at 42 and connected by spring 43 is rocked to engage the teeth 44 of the ratchet segment positively insuring termination of the counter-clockwise rotation thereof with the shaft 40.

For resetting the conveyor, which will hereinafter be discussed, by clockwise rotation of the shaft 40, there is provided a release lever 50 including a detent 51, the lever 50 being held in vertical inoperative position during the normal dispensing operations of the apparatus, by a simple coil spring 52. When the released lever 50 is moved downwardly by counter-clockwise rotation on its axis 53, the detent 51 strikes the extended arm 54 of the ratchet pawl 37, releasing the pawl from engagement with the ratchet teeth 38 of the wheel 39 and at the same time causing the arm 54 to strike the arm 55 of a pivoted ratchet catch 56 which otherwise engages the teeth 38 of the ratchet wheel 39 to preclude inadvertent released motion. With the ratchet wheel so released, it with its shaft 40 is free to be rotated in clockwise direction to reset the conveyor.

Reference may be had to FIGURES 9 and 10 for a consideration of the conveyor mechanisms. It will be understood from a consideration of these figures that the shaft 40 extends inwardly transversely in the machine and is provided with a roller 60 to which the end 61 of a conveyor belt 62 is attached.

From the rollers 60 of the shaft 40, the conveyor belt is entrained over a parallel idler roller 63, and extends therefrom rearwardly in the machine to engage a conveyor follow block 64 mounted on casters 65, guided as at 66. Thus the arrangement is such that as the handle 19 is moved forwardly upon release of the cam plate 21 by the coin control latch 22, the shaft 40 is rotated until release of the slide 32, hence imparting successive limited step by step motions to the conveyor follower 64.

For determining the extent of the rotation of the shaft 40 with response to a full movement of the lever 19, then hence the forward progress of the bulk paper supply on the conveyor in front of the conveyor follower, there is provided a limit feeler leaf 70 pivotally mounted on shaft 71 and connected by arm 72 and link 73 to the arm 74 of the latch 35. By this arrangement, as the conveyor is moved to present successive papers forwardly in the device, each succeeding paper strikes the leaf 70 to pivotally move the same, rocking the link forwardly to counter-clockwise rotate the bell crank latch and release the slide 32 at which time the latch releases the slide 32 transferring the pivotal movement of the lever 28 from its fulcrum point 31 on the sliding plate to its fulcrum 29 on the link 30, thus terminating rotation of the shaft 40 and hence further movement of the conveyor arrangement.

The movement of parts in sequence of operation thus far described, by which succeeding papers are presented to the front 11 of the cabinet, is accompanied by simultaneous action for successive release of the papers thus presented. The hinged front 11 of the cabinet defines a paper display opening 80 through which the headline and banner of the newspaper may be viewed either directly or through a transparent protective covering. Below the opening 80 a fixed cover 81 defines a paper discharge channel 82. Beneath the channel 82 there is provided a valve guide 83 through which valve plates 84 move to an upward position indicated in FIGURE 10, whereby they confront the front paper of any stack presented by the movement of the conveyor. However, in the counter-clockwise movement of the cam plate 21, the valve actuator arm 95 is retracted by the engagement of rollers 90 on cam plate on either side of a reset arm 91 pivoted as at 92A on a bracket 92, secured as at 93 independently of the cam plate 21. As the cam plate is revolved by the shaft 20 by operation of the handle 19, the arm 91 rocks in counter-clockwise direction, delatching the latch 98 from crank 99 by withdrawing crank 99 from the catch recess of latch 98, the latch 98 being pivoted as at 98' and being urged in clockwise direction by spring 98''. Upon the return stroke 91 picks up 99 retracting the valves to permit withdrawal of the foremost paper by manual grip of the paper in the opening 94 at the front of the machine. However, as the paper is withdrawn it will contact the valve control arms 95, pivotally moving them to reposition the valve plates in front of the next adjacent forward paper in the stack, thus precluding a successive unauthorized withdrawal of another paper until the handle again moves through its cycle.

As the cam plate 21 is revolved by the shaft 20 by operation of the handle 19, the reset arm 91 rocks in a counter-clockwise direction through engagement of the cam rollers 90. At the terminus point of the forward pull of the handle 19, detent 96 of reset arm 91 depresses arm 97 of actuator crank latch 98 which releases actuator crank 99 and allows it to nestle in slot 100 of reset arm 91, as shown in FIGURES 5 and 6. When the handle 19 is returned to its normal position, reset arm 91 carries actuator crank 99 back to a cammed catch 101

which causes crank to disengage itself from reset arm **91** and remain held in catch **101**, as shown in FIGURE 3, until a paper is withdrawn. When a paper is withdrawn through channel **82**, valve actuator arm **95** is arched downward and through concave recesses **102**, thus moving sliding valve plate mechanism **84** upward, once again precluding unauthorized removal of a paper. The valve plate mechanism and its operating linkage may best be seen in FIGURES 7, 8, 9 and 10, but particularly in FIGURES 9 and 10, to wit; as the forwardmost paper is grasped at uppermost portion of depression **112** and brought into channel **82**, it engages actuator arm **95** pivoted on shaft **113**, swinging arm **114** counter-clockwise bringing link **115** pivotally connected to link **114** at **116** upward, which brings link **117**, connected to link **115** at **118**, upward through a clockwise arc. Upper end **119** of link **117** is pivotally connected to valve plates **84**, which causes valve plates **84** to slide upward in channels **83**. Lower end **120** of link **117** rests somewhat freely in slot **121** of support bracket **122**, forming a free pivot point for lower end of link **117**. It will be noted that adjusting screw **130** is shown as one means of restraining the removal of more than one thickness of a given edition of a newspaper by restricting the opening at the top of channel **82**, which is constructed to take the thickest editions of newspapers.

From the foregoing description of structure and function, it is believed that the entire operation of the apparatus will be fully understood by those skilled in the art. Suffice, therefore, to point out that in originally loading the cabinet, the conveyor is reset to its rearward position by release of the ratchet wheel **38** connected with shaft **40** by depression of the lever **50**, whereupon the conveyor may be shifted to rotate shaft **40** in clockwise direction as the conveyor is moved to the rear of the cabinet. Papers may then be stacked on the conveyor with their edges supported by the conveyor surface after the doors have been swung to the open dotted line position as illustrated. Since in so setting the machine for the original operation, the valve plates **84** would normally be in lowered position, manual movement of the actuator arm **95** is required to raise the valve plates to preclude the extraction of a first paper which otherwise would be possible without the deposit of a coin and movement of the lever **19**. Having manually reset the valve mechanism, the parts are as indicated in FIGURE 4, with the valve in position. With the parts thus arranged, the insertion of a coin releases the cam plate and the handle is free to move forwardly to the position of parts as indicated in FIGURE 6. As indicated by the dot and dash lines of FIGURE 4, and in FIGURES 7 and 9, after return of the handle parts will be thus arranged to permit paper withdrawal, such manual manipulation distorts the paper to the dotted line position shown in FIGURE 9 whereupon the manual withdrawal of a paper will again reset the valve to the position indicated in FIGURE 4.

From the foregoing, it will be seen that the present invention provides a novel, simple and improved means for the dispensing of newspapers or like material. The machine is completely automatic in operation throughout the dispensing of successive papers in the manner herein set forth. Among the several advantageous features, is the arrangement of the entire operating mechanism within the enclosure **18**, thus providing ready access for inspection, adjustment and repairs of the operating mechanism without further disassembly, other than the removal of the enclosure. Since upon upward movement of the valve, its edges are received within a transverse channel **140** precluding bending or distorting the valve plate, it is impossible to extract a paper without authorization by movement of the handle even though the paper be crumbled or mutilated for the purpose of unauthorized withdrawal. Since the doors of the cabinet swing fully open and since the conveyor may be readily reset through operation of the lever **50**, the insertion of successive batches of papers may be accomplished rapidly. A further important feature of the invention is the fact that the parts are so constructed and arranged as to function with minimum wear, and the simplicity is such that servicing of the machine may be accomplished without requiring skilled technicians. It will, of course, be understood that in the practice of the invention, variations of design of the total machine, as well as the individual operating parts, is contemplated. Thus, numerous changes, modifications and the full use of equivalents may be resorted to without departure from the spirit or scope of the invention, as outlined in the appended claims.

What I claim is:

1. A newspaper dispenser including, a cabinet defining a newspaper discharge opening, a newspaper supporting conveyor within said cabinet, means for moving said conveyor in successive step by step movements to successively present newspapers to said discharge opening, means responsive to the presentation of a paper at said opening for terminating the movement of said conveyor, and means successively operable in response to withdrawal of a newspaper from said opening for precluding unauthorized withdrawal of a succeeding paper.

2. An operating mechanism for the conveyor of a dispensing mechanism including, a camming plate, a lever, means for engaging one end of said lever for movement by said plate, a conveyor operating link engaged intermediate the ends of said lever, slidable means for pivotally mounting the opposite end of said lever and, releasable means for temporarily restraining said slidable means against sliding movement.

3. An operating mechanism for the conveyor of a dispensing mechanism including, a camming plate, a lever, means for engaging one end of said lever for movement by said plate, a conveyor operating link engaged intermediate the ends of said lever, slidable means for pivotally mounting the opposite end of said lever, and releasable means for temporarily restraining said slidable means against sliding movement, said last mentioned means being operable upon release to restrain said link against motion in response to motion of said plate.

4. An operating mechanism for the conveyor of a dispensing mechanism including, a camming plate, a lever, means for engaging one end of said lever for movement by said plate, a conveyor operating link engaged intermediate the ends of said lever, slidable means for pivotally mounting the opposite end of said lever, and releasable means for temporarily restraining said slidable means against sliding movement, said last mentioned means being operable upon release to restrain said link against motion in response to motion of said plate and a control for said releasable means operable in response to movement of a conveyor by said link.

5. A newspaper dispenser including, a cabinet defining an opening from which newspapers may be manually withdrawn, a conveyor within said cabinet for supporting a stack of newspapers with their edges in parallel relation to said opening and for moving said stack to successively present newspapers to said opening for successive manual withdrawal, and means operable to move said conveyor in successive step by step increments equal to the thickness of newspapers of said stack, said means including a check controllable manual handle, a cam plate operable by said handle, a pivoted lever operable by said plate, a link engaging said lever and means for shifting the pivot point of said lever from operable to inoperable position with respect to said link.

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