

April 27, 1965

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3,180,518

MECHANICAL VENDOR FOR ARTICLES

Filed June 27, 1963

4 Sheets-Sheet 1

FIG. 1

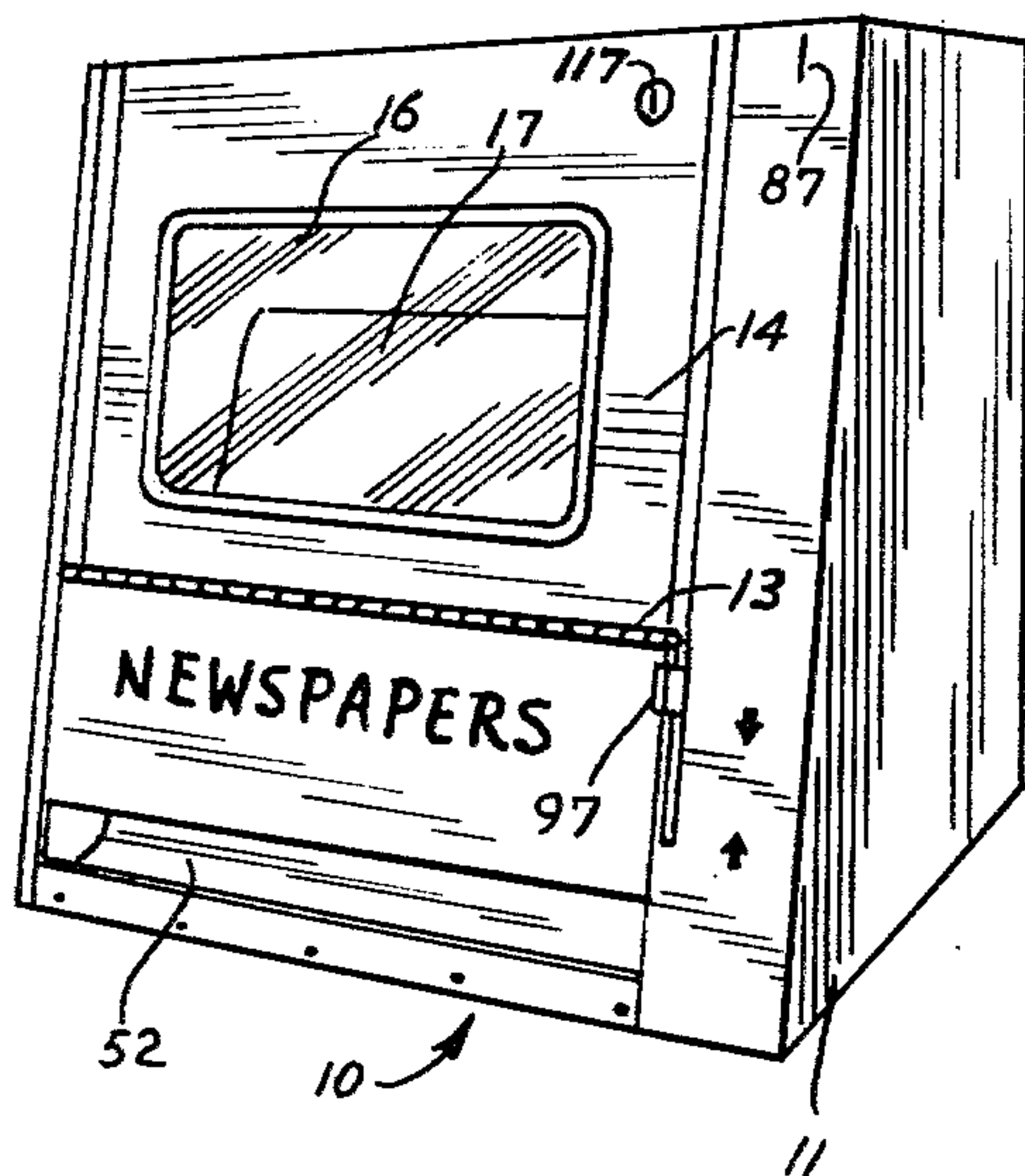


FIG. 2

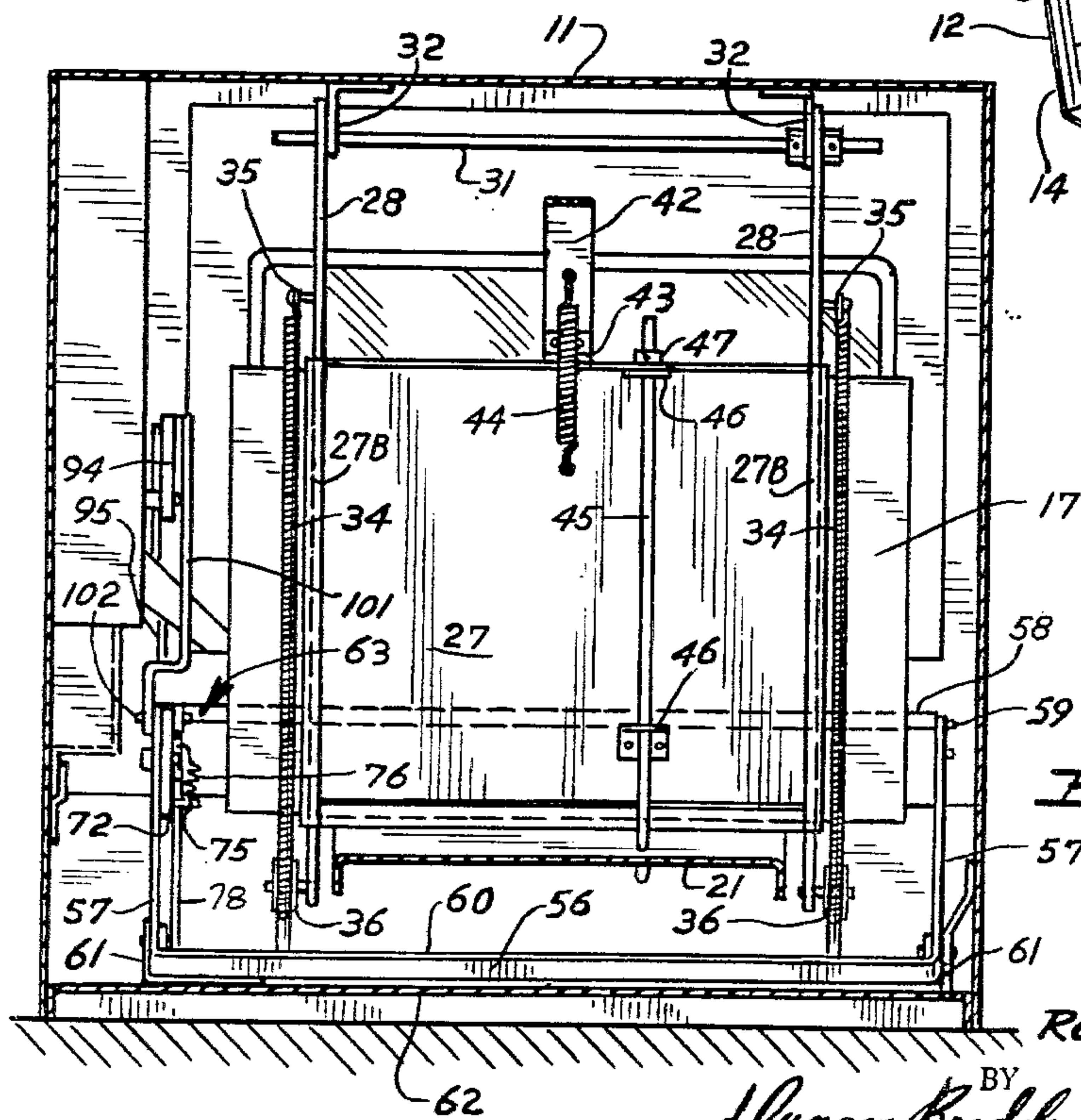
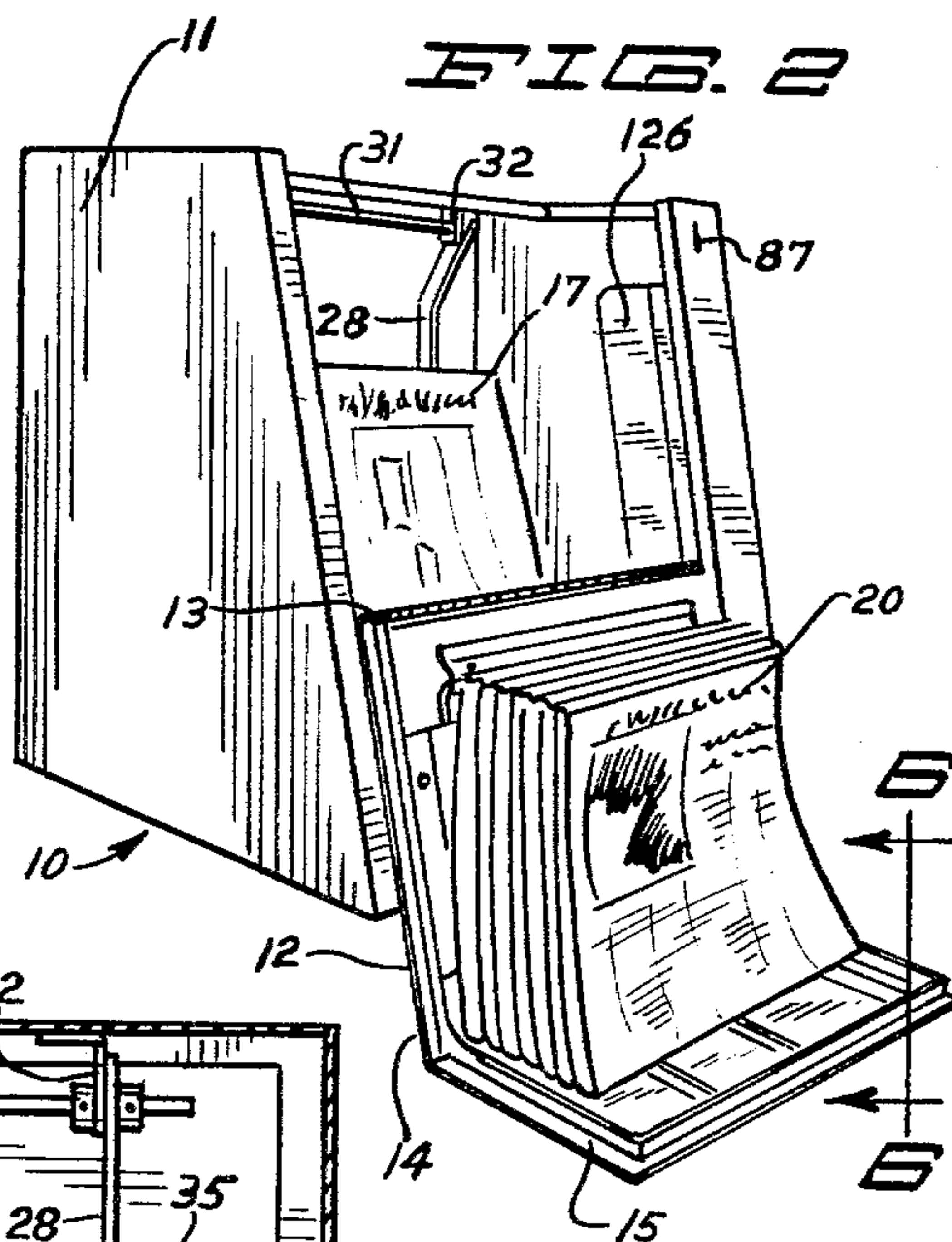


FIG. 7

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4 Sheets-Sheet 2

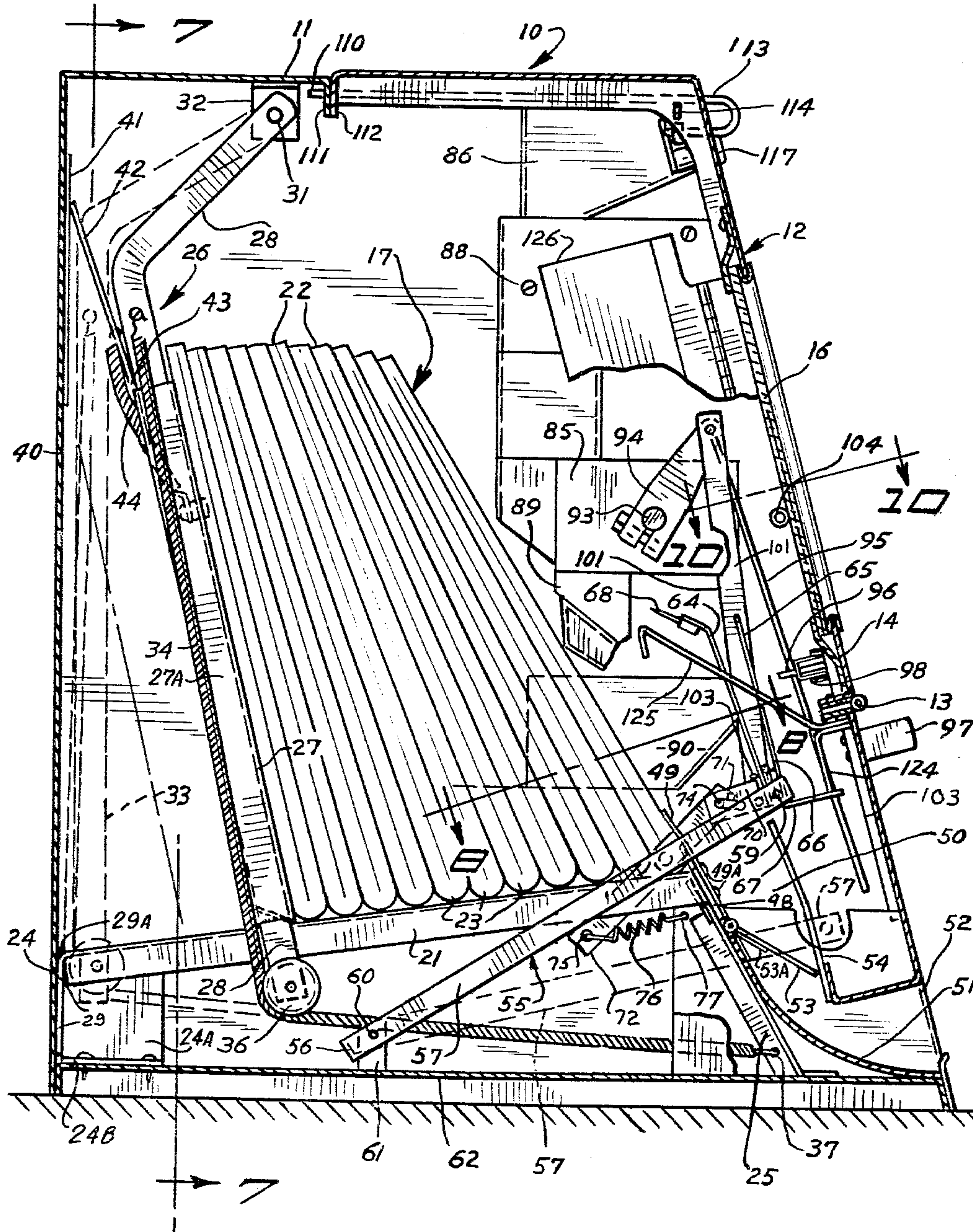


FIG. 2

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FIG. 4

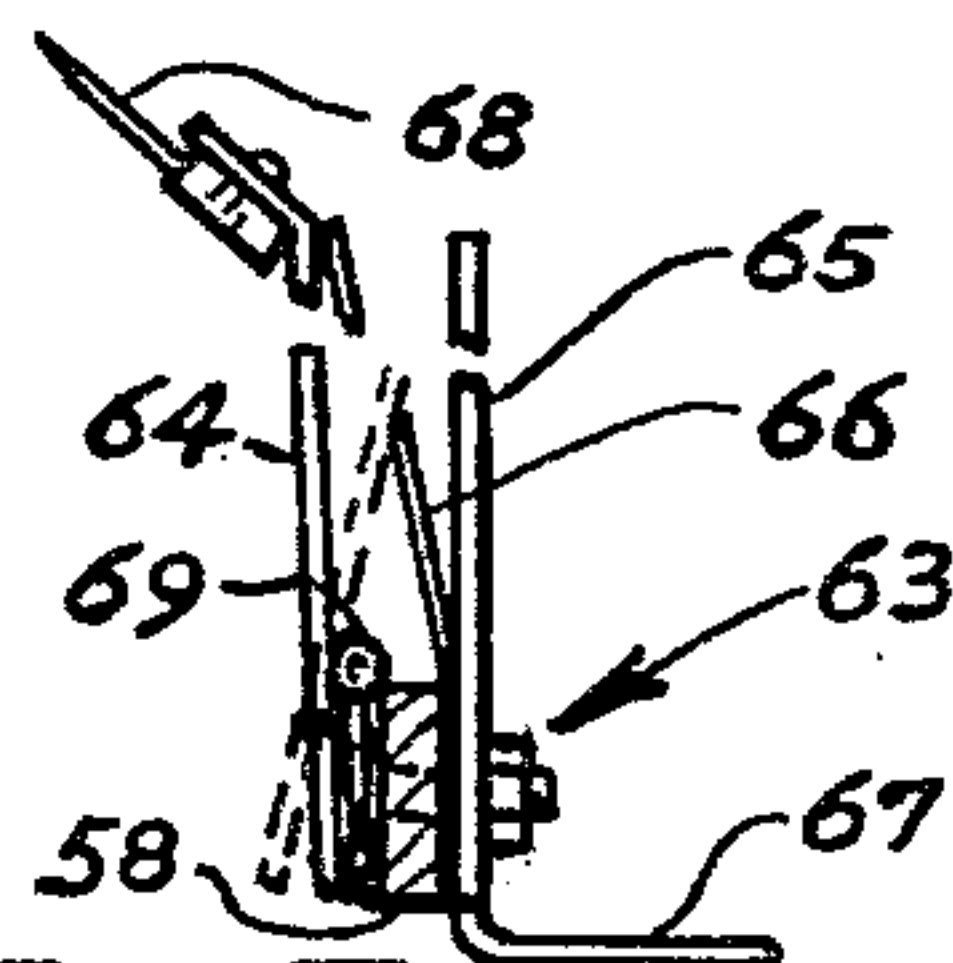
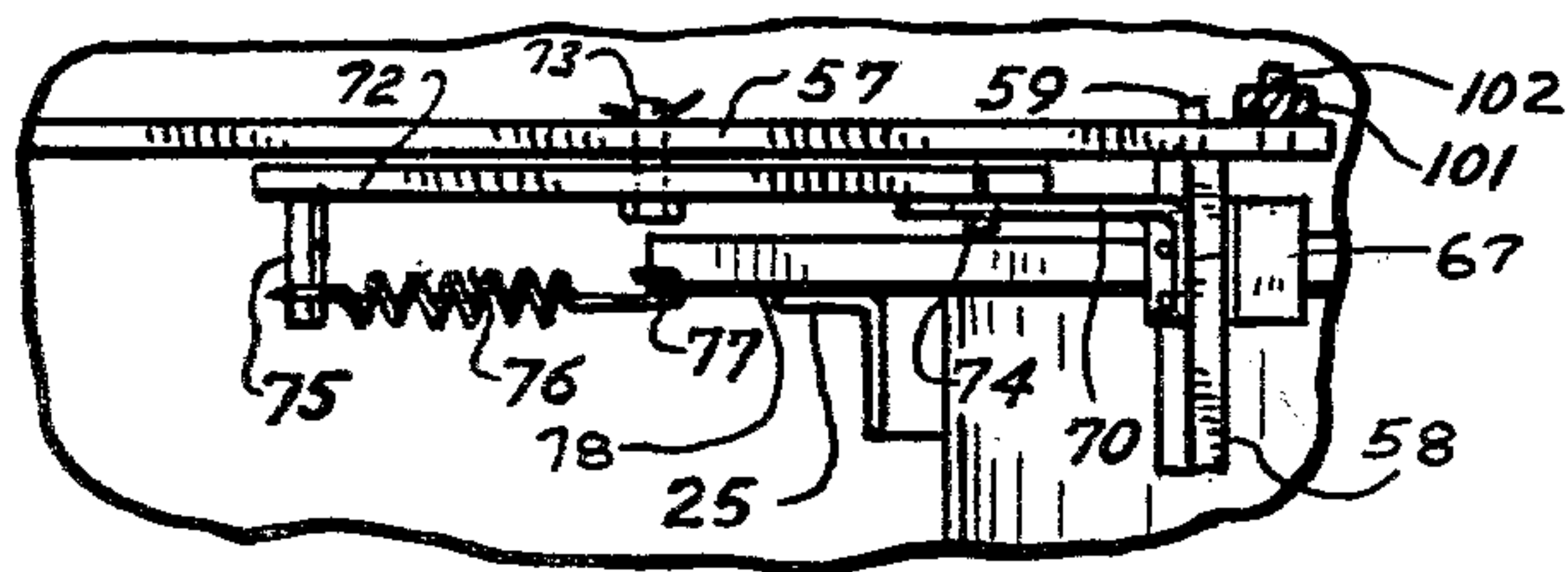
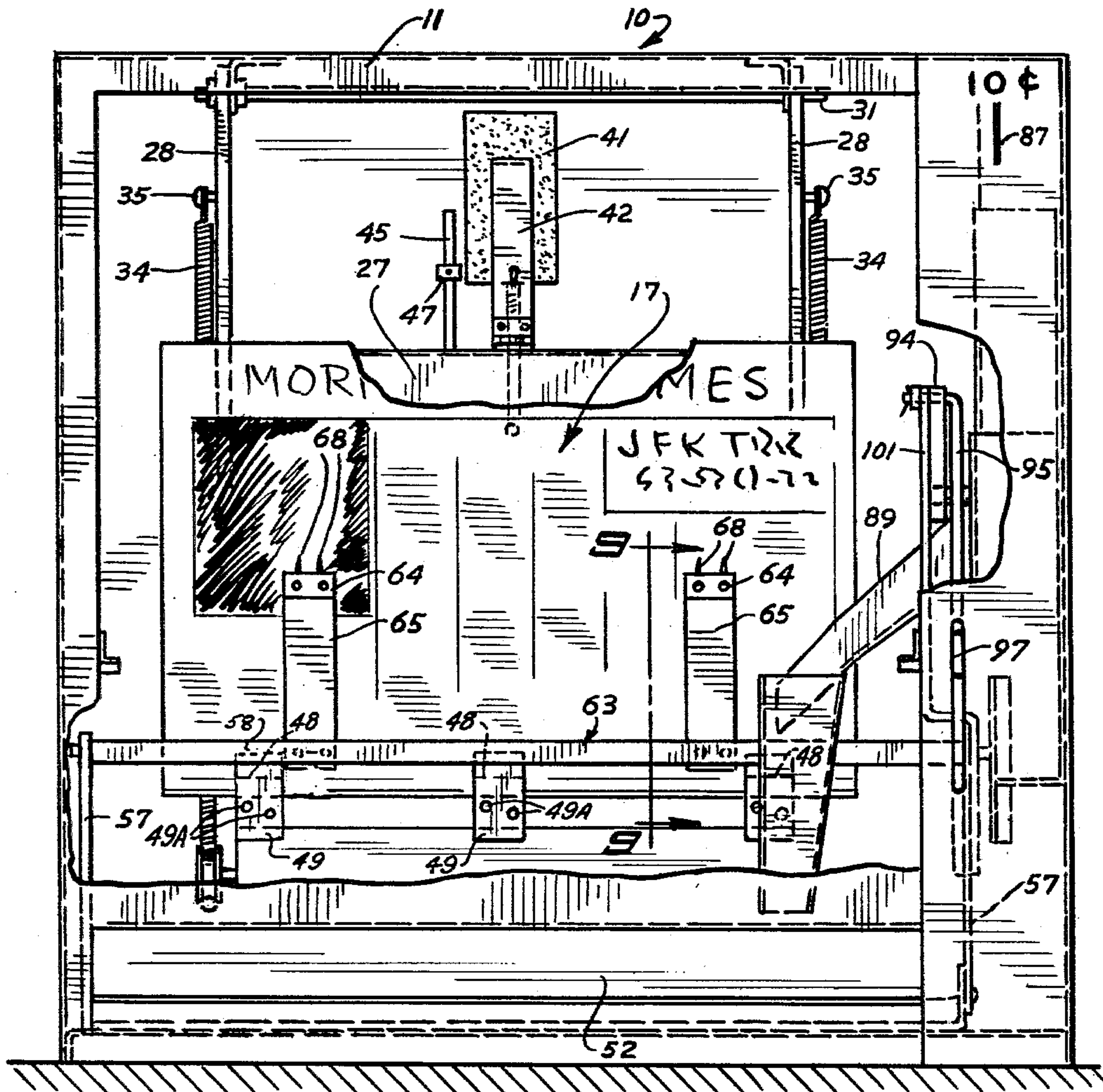


FIG. 5

FIG. 6

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MECHANICAL VENDOR FOR ARTICLES

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FIG. 5

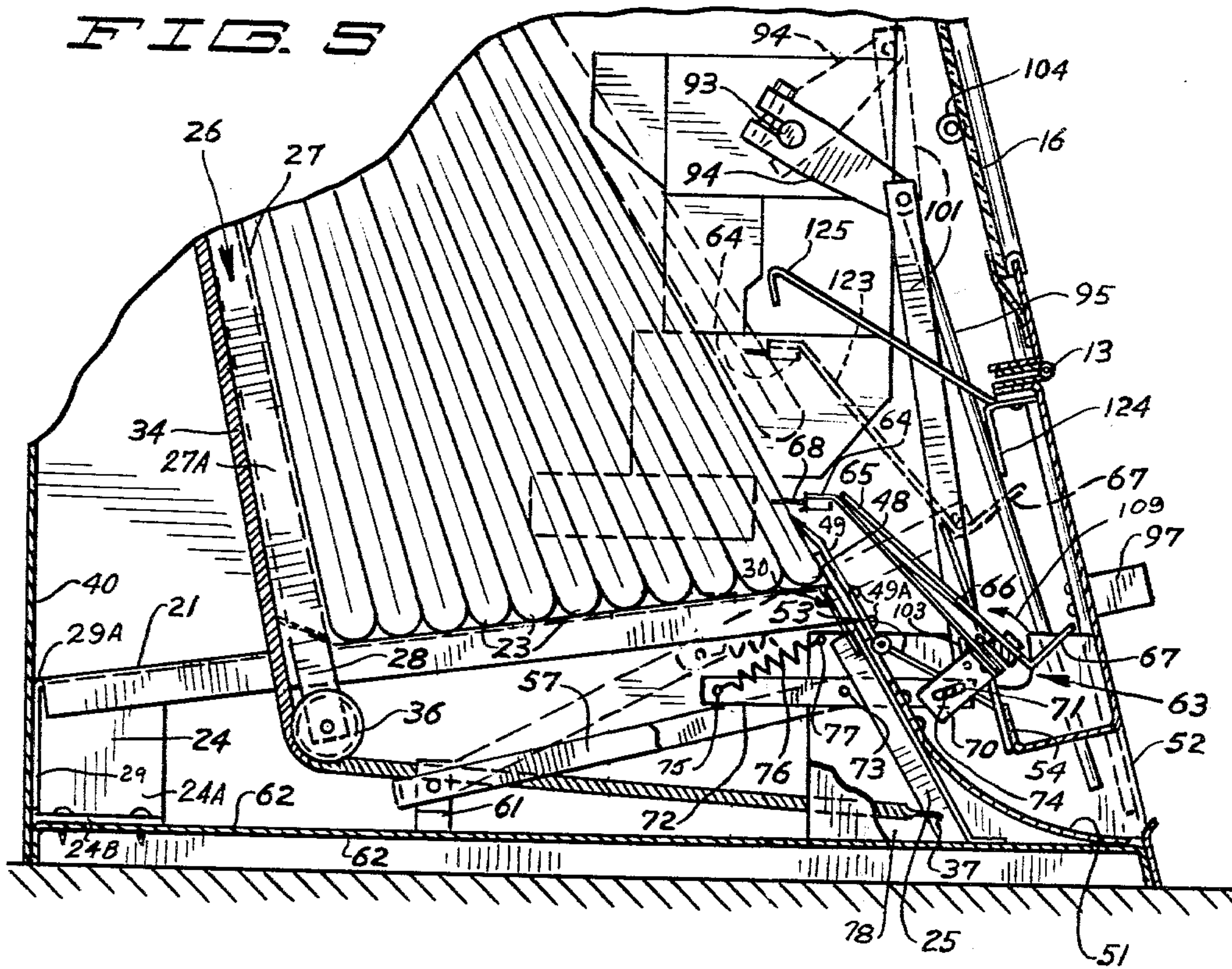


FIG. 6

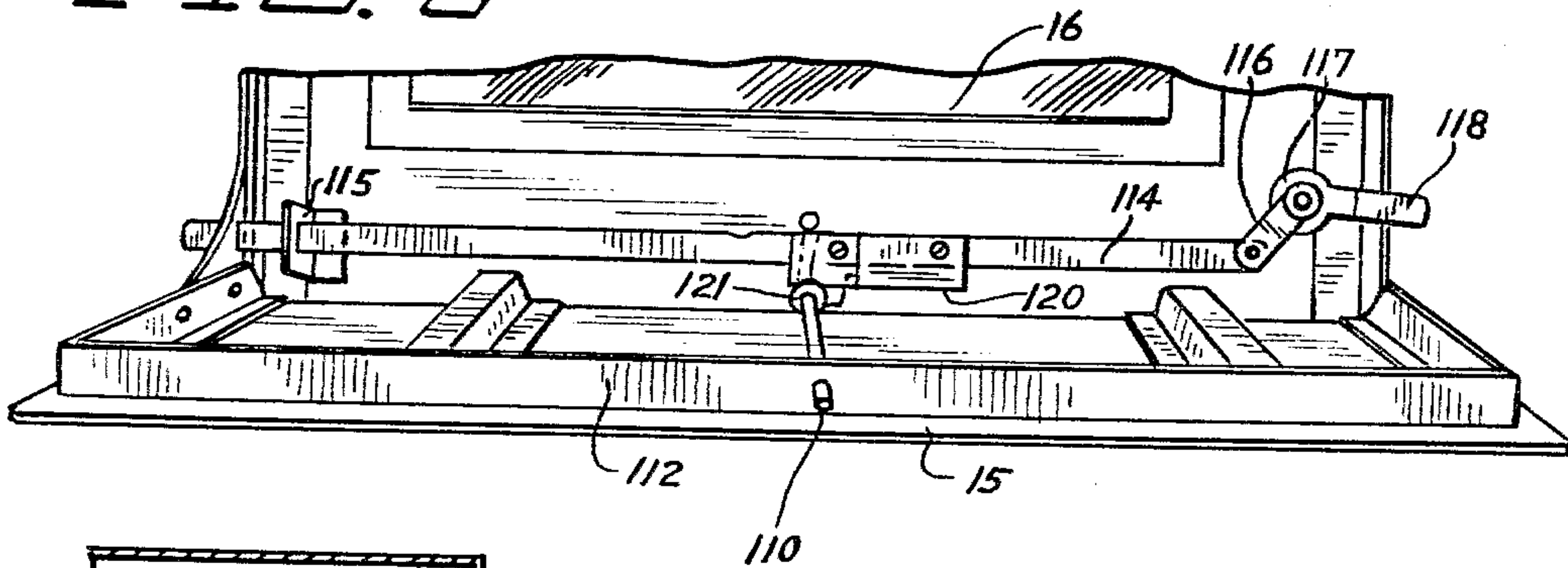
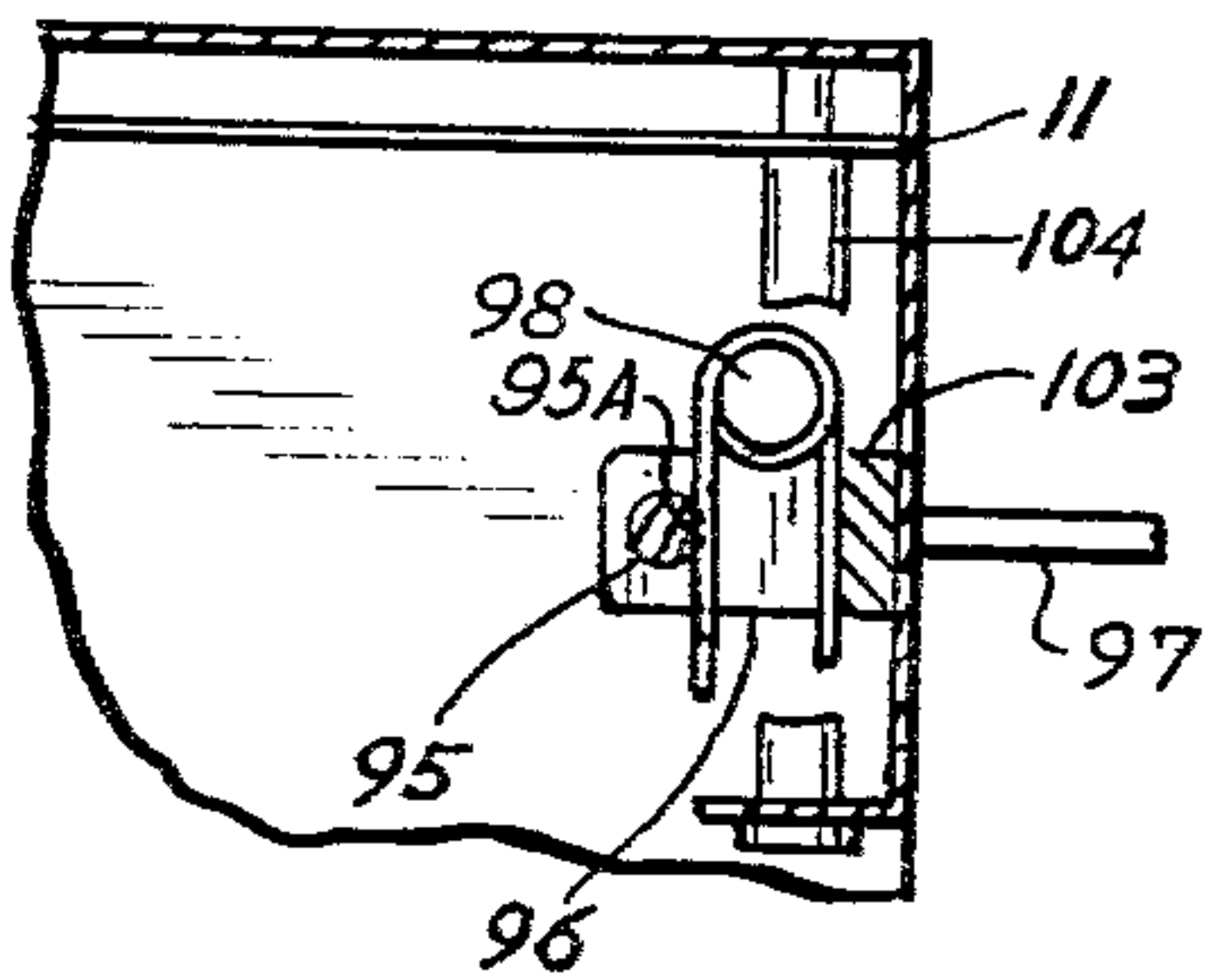


FIG. 10



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MECHANICAL VENDOR FOR ARTICLES

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Filed June 27, 1963, Ser. No. 291,028

15 Claims. (Cl. 221—39)

The present invention relates to vendors and more particularly to a vendor which can be utilized for vending many different types of articles including newspapers and magazines.

The problem of vending newspapers and magazines has long existed. Large newspaper publishers lose a great deal of money through theft. There are some news vendors on the market but these require adjustment and individual loading of papers which is time consuming and costly. For example, in order for a news vendor to be operative it must be able to vend (substantially without misses) papers ranging in size from a minimum of 4 to 6 sheets to the very large editions.

The newspapers and news magazines do not have good article definition. The individual items tend to adhere together and are not easily separated. This makes most vendors impractical.

Also, news vendors must be extremely sturdy and have very good locks thereon in order to prevent pilfering of the coin boxes. The unit also must be operated without vending more than one paper for each coin inserted. Mechanical news vendors have a strange fascination for many people in that they feel compelled to try to get more than one paper for their coins.

The news vendor of the present invention in the form disclosed presents a compact easily manufactured structure which will vend papers from a very minimum of thickness to the large editions, substantially without failure.

As disclosed, the unit is a coin operated vendor that has a substantially horizontal storage hopper, as contrasted to the vendors using vertical hoppers, the articles are not fed by gravity in the device of the present invention. The vendor has feed arms with needle-like prongs that pierce the front portions of the paper or article being vended, lift it up out of its storage hopper, position the paper properly and then the paper is removed from the needles. The paper slides down through the discharge chute to the outside of the vendor.

The motion of the needles is such that the weight of the paper determines the amount that the needles seat into the paper and thus a wide variety of thicknesses can be dispensed interchangeably. With light papers the needles do not penetrate a great amount and with heavy papers the needles seat deeper.

The feed mechanism can be adapted to be used with other items such as paper back books by changing the feed bar so that these items are lifted from beneath rather than using the needle feed. The changing of the feed bar can be done very rapidly.

It is an object of the present invention to present a coin operated vendor that will work many different products.

It is a further object of the present invention to present a news vendor which will vend papers of different thickness without any mechanical changes.

It is a still further object of the present invention to present a vendor utilizing a unique feeding mechanism to maintain a uniform feed pressure on the item being vended regardless of its thickness.

Another object of this invention is to present a tamper proof vendor.

It is a further object of the present invention to present a vendor that does not use a gravity feed storage hopper.

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Other and further objects are those inherent in the invention herein illustrated, described, and claimed, and will become apparent as the description proceeds.

To the accomplishment of the foregoing and related ends, this invention then comprises features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however of but a few of the various ways in which the principles of the invention may be employed.

The invention is illustrated by reference to the drawings in which corresponding numerals refer to the same parts, and in which:

FIG. 1 is a front perspective view of a news vendor made according to this present invention;

FIG. 2 is a perspective view of the device of FIG. 1 with the cover in its open position showing newspapers being loaded into the vendor;

FIG. 3 is a vertical sectional view of the device of FIG. 2;

FIG. 4 is a front elevational view of the device of FIG. 3 with parts broken away to illustrate internal mechanism;

FIG. 5 is a fragmentary sectional view of the device of FIG. 3 illustrating the positions of the feed mechanism of the vendor during a vending cycle;

FIG. 6 is a fragmentary enlarged front elevational view of the cover for the vendor taken as on line 6—6 in FIG. 2;

FIG. 7 is a rear elevational view taken as on line 7—7 in FIG. 3;

FIG. 8 is a fragmentary top plan view of a portion of a feed mechanism of the invention taken as on line 8—8 in FIG. 3;

FIG. 9 is a fragmentary sectional view taken as on line 9—9 of FIG. 4; and

FIG. 10 is a fragmentary sectional view taken as on line 10—10 in FIG. 3.

Referring to the drawings and the numerals of reference thereon, a vendor illustrated generally at 10 includes an outer cabinet 11 in which the mechanism for the vendor is mounted. The outer cabinet 11 has a cover member 12 hingedly attached thereto with a transverse hinge 13. The cover member has a front panel 14 and a top panel 15. The front panel 14 has a window 16 therethrough so that people can observe the newspapers, illustrated at 17, in the vendor.

While the example shown in the present application will deal primarily with newspapers, it is to be understood that the vending machine can be used with any type of article with particular reference to newspapers, magazines and pamphlets.

As can be seen in FIG. 2, when newspapers are to be placed in the vendor the cover member 12 can be opened to position as shown in FIG. 2. The top panel 15 forms a shelf on which a stack 20 of newspapers that are to be placed within the vendor may be placed. This allows the person filling the vendor to set the newspaper stack 20 down onto the cover panel when he removes the old newspapers 17 from the vendor.

Paper storage and feed hopper

A stack of newspapers 17 within the cabinet is placed in the newspaper hopper and is set down onto a deck 21. The stack 17 is made up of individual papers 22 which are folded at the bottom edges, as at 23. The bottom fold portion 23 is placed on top of the deck 21. The papers should be reasonably well aligned but the vendor will work with some irregularity to the folded edges. The deck is removable from the cabinet. It is held in place with a rear flange 29 that is integral with the deck and formed by bending the deck downwardly as at 29A.

The flange 29 fits between brackets 24, 24 and the rear wall 40 of the cabinet. The brackets 24, 24 are L-shaped having upright legs 24A and horizontal legs 24B which are fastened to the floor of the vendor, as shown. The upright legs 24A are spaced forwardly from the rear wall 40 a sufficient distance so that flange 29 slips between the upright legs and the rear wall. This can be seen in FIGS. 3 and 5. The deck has front brackets 30 that slip over the front support 25. The deck 21 is sloped upwardly from the rear wall toward the front of the vendor. The deck is substantially horizontal as compared to the vertical storage of most other vendors. The feeding of the articles to be vended as shown do not depend on gravity feed.

A pusher plate assembly 26 includes a plate member 27 slidably mounted on a pair of arms 28, 28. The edges of the pusher plate are folded over the outside of the arms as shown at 27A and around the rear edge of the arm at 27B. The plate can slide up and down on the arms. The arms 28, 28 are bent as shown in FIG. 3 and are pivotally mounted as at 31 to brackets 32 attached to the top wall of the cabinet 11. The pusher plate assembly 26 is movable to position wherein it will move the last of the newspapers in the hopper to the front or upper end of the deck. The edges of the plate member 27 are formed over the arms 28, 28 as shown at 27A and 27B and will slide along the surface of the deck as the arms swing. This means that the plate slides longitudinally on the main portion of the arm.

The movement of the pusher plate assembly is controlled by a pair of springs 34, 34 each of which is attached to one of the arms 28, 28 as at 35, 35. The springs extend down along the main portion of the arms 28 and over a pair of pulleys 36, 36 rotatably mounted at the lower ends of the arm. The springs then extend forwardly and are attached as at 37, 37 to the front support 25 of the deck.

Attaching the springs in this manner causes them to exert a large force against the papers when the stack is on the deck is large and a lesser force when the stack decreases. When the stack is lighter the force necessary is less and the spring arrangement compensates for removal of papers. When the pusher plate assembly is adjacent the front of the deck the springs 34 are substantially straight and exert very little force on the pusher plate.

As can be seen the arms 28, 28 extend downwardly past the deck and the arms straddle the deck 21. The plate 27 bears directly on the rear paper in the stack. The plate is slidable on the arms 28, 28. As the assembly pivots there is no sliding between plate 27 and the rear paper. This insures that the paper remain in proper position.

As the pusher frame 26 advances it is prevented from again moving toward the rear wall 40 of the cabinet 11. A strip of skid resistant material 41 (stair tread material) is attached to the rear wall 40 on the inside thereof and a tongue 42 is hingedly attached as at 43 to the top portions of the pusher plate. The tongue 42 moves downwardly against the friction material 41 under urging of a spring 44 as the pusher plate moves toward the front of the cabinet. The end of the tongue engages the friction material 41 and preventing the pusher plate from being moved rearwardly. The spring 44 also exerts some forwardly directed force on the pusher frame. This is particularly true when the frame is far forwardly. The spring 44 insures that the last papers are moved into position to be vended.

The aid in loading the feed hopper, a rod 45 is slidably mounted in brackets 46, 46 which are attached to the rear pusher plate. As shown in FIG. 7 the rod can be inserted through a hole provided in the deck 21 and thus hold the pusher frame in a rearwardly position while a stack of papers is loaded into the feed hopper. When the hopper is loaded the rod can be removed from

its locking hole to release the pusher frame. A stop collar 47 is provided to prevent the rod from moving too far through the deck.

At the forward edge of the deck 21 there are a plurality of upright stops 48 attached to the deck. The stops are relatively short and stiff and form a portion of the brackets used to hold the deck onto the front supports 25. The stops 48 project upwardly above the deck and engage the paper stack 17 and prevent it from sliding forwardly off the deck under the urging spring 34. A separate leaf spring guide member 49 is positioned on the outside of each stop 48 and is held fixed on the stop with rivets or bolts 49A which also hold the stops 48 to the deck (see FIG. 3). The upper ends of members 49 are bent so as to bear on the papers above the stops. The springs 49 permit a paper to be slid upwardly. The springs 49 will immediately engage the next paper in the stack. The forward surfaces of the springs provide a smooth surface for the paper being vended to slide against as they pass into the delivery chute. When the papers are removed rapidly from the hopper the paper stack may lag slightly in moving forward against stops 48. The spring 49 prevents the paper being vended from "hanging up" on the stops 48 or the front of the deck when this occurs.

Feed unit

The individual papers 22 are removed from the deck 21 and fed through a discharge chute 50 with a feed mechanism or unit which permits accurate feeding of papers of all sizes. The discharge chute is comprised as a bottom curved plate 51 fastened to the cabinet and to the front support 25. The chute has an opening port 52 at the front of the cabinet and a trap door 53 is hingedly attached to the curved plate 51. The trap door is spring loaded with a small torsion spring 53A so that the free edge normally abuts against a chute front wall 54. The trap door 53 is positioned so that a person cannot insert his hand without operating the feed mechanism. The trap door easily swings downwardly out of the way against the curved portion 51 to permit a paper to drop through the chute.

The feed unit includes a drive arm assembly 55. The drive arm assembly 55 is comprised as a substantially U-shaped frame having a back member 56 and a pair of parallel side arms 57, 57 integral with and extending forwardly from the back member. A pivot shaft 60 is fixed with respect to and extends between the side arms 57, 57 adjacent and substantially parallel to the back member 56. The pivot shaft 60 extends outwardly beyond the side arms and is rotatably mounted at opposite ends thereof in brackets 61, 61 which are attached to a floor 62 of the cabinet.

A transverse feed bar assembly 63 includes a feed bar 58 that has end pins 59 pivotally mounted to drive arms 57, 57 at their forward ends and retained between the arms 57, 57 by spring pressure from the arms. The feed bar assembly thus can be changed without any tools by springing the arms 57, 57 apart to clear one of the pins 59. The feed bar assembly has a pair of pick up or feeder arms 64, 64 mounted thereon. Feeder arms are attached to the top of the feed bar with hinges 69 (see FIG. 9). Each of the arms has a pair of feeder needles 68 mounted at the top end thereof.

A pair of feeder arm stops 65, 65 are fixedly attached to the feed bar and positioned on opposite sides of the bar from the feeder arms. A separate pick up arm spring 66 is positioned between each of the feeder arms and its associated stop resiliently urges the feeder arm away from the stop. The feeder arms are mounted so that they will not move away from the stops 65 past position as shown in FIG. 3. The feeder arms will pivot toward the stops 65 and are restrained from this pivoting only by springs 66. The pick up arm springs 66 are a leaf-type spring of relatively low rate. A release bracket 67 is

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attached to the bar 53 adjacent a first end thereof. The release bracket extends forwardly from the bar.

A control bracket 70 is fixedly mounted to the feed bar assembly adjacent the first end thereof and aligned with and on the opposite side of the bar from release bracket 67. The control bracket 70 has a slot 71 provided therethrough. A control arm 72 is pivotally mounted as at 73 to a first of the side drive arms 57 of the drive arm assembly 55. The control arm 72 has a fixedly mounted control pin 74 that is slidably mounted within slot 71. An anchor pin 75 is mounted on the opposite end of the control arm 72 and extends outwardly therefrom. A spring 76 is mounted on the anchor pin 75 and also is mounted as at 77 to a side member 78 of the front support 25 of the deck.

The control arm 73 and spring 76 regulate the pivoting of the feed bar assembly about its mounting points. The drive arms move downwardly when a paper is to be vended. This causes the mounting 77, pivot 73 and pin 75 to go over center. After the three points have gone over center the force from spring 76 will cause the control arm to pivot about its pivotal axis at 73 and move the feed bar assembly. This will be more fully explained later.

Actuator system

The actuator system for the vendor includes the operating handle and its associated linkages. The vendor, of course, is coin operated and the coin unit forms part of the actuator system.

A conventional purchased coin operated unit 85 is mounted against one side wall of the cabinet. An infeed chute 86 is positioned so that it is open to a coin slot 87 provided through the front wall of the cabinet. The infeed chute 86 directs the coin from the slot through a coin rejector 88 which will either transfer the coin to a rejection chute 89 or will divert the coin through the coin operated unit 85 and thus into the money box illustrated at 90.

If a coin is placed in the slot and the coin is diverted into the coin operated unit, a shaft 93 in the coin operated unit is free to move through one cycle. An actuator arm 94 is drivably mounted on the shaft 93 as shown in FIGS. 3 and 5.

If the rejector rejects the coin it will be deposited in the paper chute and returned to the customer.

A rod 95 has an end portion that is pivotally mounted through a provided opening at an outer end of arm 94 and the rod extends downwardly through a bracket 96 which is attached to an operating handle 97 that extends through a slot to the outside of the cabinet. The handle 97 is mounted onto a slide bar 103 that is guided by a roller 104 that is rotatably mounted with respect to the cabinet. The rod 95 is held in the brackets 96 with a torsion spring 98. The rod 95 has a notch 95A in the surface thereof into which the actuator portion of the spring seats. This provides a detent action so that the bracket will normally drive the rod 95 but will prevent overloads on the mechanism by slipping if the force on the handle 97 exceeds a certain amount.

When a coin has been passed through the coin unit the handle 97 and associated linkage can be moved downwardly and this in turn will move the rod 95 and the arm 94 downwardly. A drag link 101 is also pivotally mounted to the portion of rod 95 that extends through the outer end of arm 94. The drag link 101 extends downwardly and is mounted onto a pin 102 at an outer end of the adjacent side drive arm 57 of the drive arm assembly 55. The pin 102 is mounted through a slot 103 at the bottom of the drag link 101. By moving the handle 97 downwardly to the end of its stroke and then again upwardly to its original position, the feed unit will be actuated to dispense a paper out through the chute.

Cover unit locking system

The cover 12 is mounted with hinge 13 to the front

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panel of the cabinet. When the unit is to be locked the cover is closed and a locking rod 110, which is carried by the cover is passed through a hole in a flange 111 on the cabinet. The locking rod 110 also passes through a flange 112 in the cover member.

The locking rod 110 has a U-shaped end member 113 that is operable from outside the cabinet. Both legs of the U extend into the cover member when the rod is in locked position as shown in FIG. 3. A locking bar 114 is slidably mounted through a bracket 115 at one side of the cover member and is mounted onto a locking arm 116 adjacent the other side of the cover. The locking bar is positioned so that it can be moved to protrude beyond the side edge of the cover member. The locking arm 116 is in turn attached to a tubular eccentric lock member 117 which is operated with a key. The eccentric lock member 117 also controls a second lock bar 118 which may be moved to protrude out the adjacent side edge of the cover. To open the cover, the locking bars are moved to points wherein they do not protrude beyond the side edges of the cover member and with the locking bars in this position the rod 110 is moved to clear flange 111. Then the cover can be opened.

When the unit is to be locked, the cover is closed, the lock rod 110 is inserted through the flanges 112 and 111 of the cover and cabinet and the key is turned to rotate the eccentric lock member 117. This forces the lock bars 114 and 118 to protrude outwardly beyond the side edges of the cover. The ends of the locking bars will thus be inside the cabinet adjacent the front panels that are positioned along the sides of the cover opening. A stop member 120 attached to locking bar 114 is against a provided stop collar 121 fixed on locking rod 110. The member 120 is between the collar and the front of the cabinet so that the rod 110 cannot be withdrawn a sufficient distance to clear the flange 111. Thus the top panel 15 cannot be pried up nor can the front be pried.

When the unit is to be opened the key is turned the opposite direction and the lock member 117 operates to move the lock bars 114 and 118 so that they no longer protrude beyond the edges of the cover. The cover can then be opened about its hinge 13. By providing a positive lock in two places the cover is substantially jimmy proof and the vendor is not susceptible to loss through theft.

Operation

With a stack of newspapers in the vendor, as shown in FIG. 3, a person wishing to have a newspaper will deposit a dime in the slot 87. The coin operated mechanism will then function permitting the arm 94 to be moved. This is done through operating handle 97 which moves the slide 103 and, through bracket 96 pulls on rod 95. This pulls the arm 94 downwardly activating the drag link 101 and pivoting the drive arm assembly 55 about the pivot shaft 60. The side drive arms 57, 57 move downwardly, as previously stated. As the first side drive arm goes down the pivot 73 of control arm 72, control pin 75 and the attachment point 77 of spring 76 pass over center. The pivot point 73 moves below the spring. The arms 57, 57 are moved further and the force angle of the spring 76 will be great enough to pivot the control pin end of arm 72 upwardly and the other end downwardly. The spring causes a snap action. This in turn will cause pin 74 to move bracket 70 downwardly and pivot feed bar assembly 63 in direction as indicated by arrow 109 in FIG. 5. This occurs after the drive arm assembly has moved substantially to position as shown in FIG. 5. The spring force from spring 76 snaps the control arm over center and in so doing snaps the feeder arms 64 toward the stack of papers. The needles 68, 68 on each of the pick up arms penetrate the front paper in the stack under the action of spring 76 when the unit goes over center. As the feeder arms are hinged on the feed bar 58 the needles are not forced into the front paper except by the inertia from

spring 76 and the pressure exerted by leaf springs 66. The slot 71 in control bracket 70 permits the feeder arms to move against the stack of papers unrestrained. The arms have sufficient freedom so that they will contact the front paper even if it is not properly positioned against the stops 48. Also, as the feeder arms 64 are individually hinged to bar 58, they each can move different distances than the other in order to contact the front paper. The feeder arms work even with irregularities.

The feeder arm needles engage the front surface of the paper under a substantially uniform spring pressure regardless of paper size and position. The needles 68 contact the paper when the handle 97 is at the bottom of its stroke. The handle is then raised which will in turn raise rod 95 and drag link 102 to raise the drive arm assembly. The needles 68 then tend to pivot toward the paper to be vended as they move upwardly and will become embedded in the front paper. The amount that the needles embed is determined by the weight of the front paper and its resistance to upward movement. The paper will be lifted up past the stops 48 and the springs 49. As soon as the bottom folded edge 23 of the paper being dispensed clears the top of spring 49 the springs will contact the paper immediately behind it under their own force, the stack will be moving forwardly from urging of the pusher plate assembly 26. This position of the paper being vended is shown in dotted lines at 123 in FIG. 5.

The handle 97 will be moved further upwardly and the release bracket 67 on the feed bar 58, will contact a bracket 124 mounted to the front wall of the cabinet. The bracket 124 will force the feed bar assembly 63 to pivot so that the upper ends of the pickup arms move toward the cabinet cover. The paper held by the needles 68 of the pickup arms will contact a stripper bracket 125 which is mounted to the front wall of the cabinet and extends rearwardly. The stripper bracket 125 will hold the paper from moving forwardly and the action of the bracket 124 on bracket 67 will cause the needles to be pulled out of the paper. The control arm 72 is pivoted about its pivot 73 to its original position as shown in FIG. 3. The control arm and feed bar assembly are set for another feed cycle.

The paper stripped from needles 68 will drop down into the chute 50 and the trap door 53 will swing out of the way to allow the paper to be removed from the vendor through port 52.

Once the handle has again reached its uppermost position the coin operated unit is locked and cannot be re-activated until another coin is dropped through the slot 87. The slot 103 in drag link 101 insures that the handle 97 must be replaced or pulled up to its uppermost extremity before the paper held by the needles 68 will be released. This is to prevent jiggling the paper off the feeder arms before the handle reaches its uppermost position. The slot 103 insures that the unit will not vend more than one time for each coin deposited.

In order to shield the coin mechanism from public view, a shield 126, which is shown fragmentarily in FIG. 3, can be provided to prevent people looking in from the window 17 from seeing the coin operated mechanism. The shield 126 is perhaps best seen in FIG. 2. The shield can be hinged to permit servicemen to swing it out of the way to adjust the mechanism.

The force with which the papers are pierced by the needle 68 is accurately controlled through the use of leaf springs 66 as well as the over center snap action under control of spring 76 of the feed bar assembly. The unique configuration of the pusher plate assembly 26 and its controlling springs 34 aids in providing a uniform backup force for the stack of papers on the deck 21. The upward incline of the deck 21 aids in properly positioning the papers. Each paper tends to be lifted with respect to the papers behind it as it is slid along the deck. This aids in minimizing the friction between the front paper and the

stack so that the feeder arms can be lifting the front paper easily.

Stop members 65 are provided to prevent over deflection of the leaf springs 66. The paper is positively removed from the needles by the stripper brackets. The springs 49 over stops 48 insure that a smooth surface is provided for guiding the paper removed from the stack into the chute 50. Without the spring stops the action of the pusher plate 26 may not be fast enough and a paper could hang up on the front edge of the deck before the entire stack of papers had moved forwardly.

Again, it should be noted, that as the stack of papers decreases in size the tongue 42 will engage friction surface 41 and prevent the pusher plate from moving rearwardly when the pickup arms are tripped so that the needles 68 pierce the front paper.

The feed unit can be used without the needles 68 on articles having good article definition. The arms 64 are provided with fingers or lugs that are positioned below the deck when the drive arm assembly is in its down position. On the upstroke of the drive arms the lugs engage the bottom edge of the article (corresponding to fold 23) and lift the article over stops 48 and springs 49. The article will be deposited in the chute 50 in substantially the same manner as the papers.

Where articles with poor article differentiation are vended, the needles on the feeder arms give positive results substantially without misses or vending double copies.

As many widely apparently different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments herein.

What is claimed is:

1. A vendor for paper articles each comprising a plurality of sheets folded together, said vendor including an outer cabinet, a storage hopper in said cabinet for retaining said paper articles on their folded edge, said hopper including a support deck inclined upwardly in a forward direction, bias means urging said paper articles toward the front of said deck, stop means on said deck to prevent said paper articles from moving forwardly beyond a certain distance, feed means comprising a pair of spaced substantially parallel drive arms pivotally mounted on said outer cabinet and having outer ends thereof positioned in front of said hopper, a feed bar pivotally mounted between said drive arms, a pair of feeder arms mounted on said feed bar and positioned in front of and adjacent the articles in said hopper, said feeder arms each having a pair of needles thereon, a control bracket drivably mounted on said feed bar, a control lever pivotally mounted on one of said drive arms and having a first end thereof pivotally mounted to said control bracket, a spring, a first end of said spring being mounted at a second end of said control lever, said spring extending in direction toward the first end of said control lever, means for mounting a second end of said spring with respect to said outer cabinet, actuator means having a control element extending outside said cabinet and being connected to said drive arms, said actuator means being adapted to move said drive arms between first and second positions, the mounting of said spring and said control lever being such that the mounting axis of said spring on said housing, the pivotal axis of said control lever on said drive arm and the mounting axis of said spring on said control lever go over center as said drive arms are moved from their first to their second position, said needles penetrating the article against said stop means under the over center action of said spring and control lever as said drive arms move from their first to their second position, a delivery chute in said cabinet positioned in front of and below said deck, said delivery chute being open to the exterior of said cabinet, and means for removing said penetrated article from said needles, said articles removing means being operable when said drive arms are moved from said second to said first position

and when said penetrated article is above said delivery chute.

2. A vendor as specified in claim 1 wherein said feeder arms are each independently, pivotally mounted on said transverse feed bar for limited movement toward and away from the paper articles in said hopper, and separate bias means between said feed bar and each of said feeder arms urging said feeder arms toward said articles in said hopper.

3. A vendor for articles including an outer cabinet, a storage hopper for said articles within said cabinet, article feed means in said cabinet positioned adjacent said articles, said feed means having a feeder arm mounted thereon, at least one article engaging member on said arm facing said articles, said article engaging member being pivotally mounted for movement from a first position wherein said article engaging member is clear of said articles to a second position for in said article engaging member moves toward and engages an article in said hopper, control means for controlling movement of said article engaging member between its first and second positions, said control means including a spring, first means to transfer force from one end of the spring to the article engaging member and second means to attach the other end of the spring to the cabinet, said means to transfer force from one end of the spring to the article engaging member being positioned so that when said article engaging member is in its first position the member is urged away from the article and when the member is in its second position the member is urged toward the article, bias means urging said article in said hopper toward said feed means, stop means on said hopper for preventing said articles from moving toward said feed means beyond a certain position, an article delivery port provided on said outer cabinet, actuator means having an element outside said cabinet for actuating said feed means in said article engaging means between its first and second positions, said actuator means being movable first to move said article engaging means from its first to its second position under control of said control means, and next to move said feeder arm and the engaged article to position wherein the article is clear of said stop means, and means for removing the article from said article engaging means after said engaged article has cleared said stop means and said feeder arm is in position to deposit said article adjacent said port.

4. A vendor for articles including an outer cabinet, a storage hopper for said articles within said cabinet, article feed means in said cabinet positioned adjacent said articles, said feed means having at least one article engaging member facing said articles, said hopper including a deck inclined upwardly in direction toward said feed means, pusher means urging said article in said hopper toward said feed means, said pusher means including a support arm pivotally mounted above said deck, a pusher plate slidably mounted on said arm for limited longitudinal direction with respect thereto and positioned to engage articles in said hopper, said pusher plate means movable from a first position at the rear of said hopper to a second position wherein it is positioned closely adjacent said feed means, said arm having a bend therein between said pivot and said pusher plate so that the inclined angle between the article engaging surface of said pusher plate and the plane of said inclined deck is less than 90° with said pusher plate in its first position and is greater than 90° with said pusher plate in said second position, bias means urging said arm toward said second position, stop means on said deck to prevent articles from moving toward said feed means beyond a certain position, actuator means for actuating said feed means first to position wherein said article engaging member engages the forward surface of the one of said articles against said stop means, said actuator means be-

ing movable to next move said feed means and engaged article to position wherein the article is clear of said stop means, and means for moving said article from said article engaging means after said engaged article has cleared said stop means.

5. A vendor as specified in claim 4 wherein a spring guide is mounted to said support arm adjacent the bottom thereof and said bias means for moving said support arm from said first to said second position comprises an elongated tension type spring fastened to said support arm above said pusher plate, is passed over said spring guide, and means to fasten said spring at its second end to said cabinet adjacent the front of said deck.

6. A vendor as specified in claim 5 and releasable stop means to prevent said pusher plate from moving from said first toward said second position.

7. A vendor for articles including an outer cabinet; a storage hopper for said articles within said cabinet; article feed means in said cabinet positioned adjacent said article, said article feed means comprising a pair of spaced substantially parallel drive arms pivotally mounted on said outer cabinet and having outer ends thereof positioned forwardly of a first end of said hopper, a transverse feed bar rotatably mounted between said drive arms at the outer ends thereof, a control bracket mounted on said feed bar, a control lever pivotally mounted on one of said drive arms and having a first end thereof pivotally mounted to said control bracket, a spring, a first end of said spring being mounted at a second end of said control lever, said spring extending in direction toward the first end of said control lever, means for mounting a second end of said spring with respect to a housing within said outer cabinet, a feeder arm mounted on said transverse feed bar, at least one article engaging member on said feeder arm facing said article; bias means urging said articles in said hopper toward said feeder arm; stop means on said hopper for preventing said articles from moving toward said arm beyond a certain position; an article delivery port provided on said cabinet; actuator means having an element outside said cabinet, said actuator means being connected to said drive arms and adapted to move said drive arms between first and second positions; the mounting of said spring and said control lever being positioned so that a mounting axis of said spring on said housing, the pivotal axis of said control lever on said drive arm, and the mounting axis of said spring on said control lever go over center as the drive arms are moved from their first to their second positions, said article engaging means engaging said article under the over center action of said spring and control lever as said drive arms move from their first to their second positions, said actuator means being movable to next move the drive arms and said engaged article to position wherein the article is clear of said stop means; and means for removing said engaged article from said article engaging means after said engaged article has cleared said stop means and said feeder arm is in position to deposit said article adjacent said port, said means for moving said article from said feeder arm being operable at the same time said drive arms are moved from said second to said first position.

8. A vendor as specified in claim 7 wherein there is a plurality of feeder arms attached to said feed bar, said feeder arms each being independently mounted on said feed bar for limited independent movement toward and away from the articles in said hopper, and bias means between each of said feeder arms and said feed bar urging the arms toward the articles in said hopper.

9. A vendor for paper articles each comprising a plurality of sheets folded together, said vendor including an outer housing, a storage hopper in said housing for retaining said paper articles, bias means urging said paper articles toward a first end of said hopper, stop means on said hopper at said first end, said stop means comprising a plurality of upright lugs which engage the bottom portions of said paper articles, a separate leaf spring mem-

ber attached to and overlying each of said stop members and extending upwardly beyond said stop member, the upper portion of said leaf springs being biased toward said articles in said hopper and engaging each of said articles in said hopper before said articles engage said stop members, feed means in said housing including at least one feeder arm positioned adjacent the first end of said hopper, said arm having at least one needle at an outer end thereof, said feed means being movable to position wherein said arm has moved so that said needle impales the article positioned against the stop means on said hopper, said feed means and said arm being further movable to move said impaled paper article clear of said stop means on said hopper and said leaf springs, the upper end portions of said leaf springs springing toward the articles in said hopper as soon as the impaled paper article clears said springs, and means for moving said paper article from said needle to position wherein the paper article can be removed from said housing.

10. A vendor as specified in claim 9 wherein there is a plurality of feeder arms attached to said feed bar, said feeder arms each being independently mounted on said feed bar for limited independent movement toward and away from the articles in said hopper, and bias means between each of said feeder arms and said feed bar urging the arms toward the articles in said hopper.

11. A vendor for articles having a penetrable surface, said vendor including an outer cabinet, a storage hopper for said articles within said cabinet, article feed means in said cabinet positioned adjacent said articles, said feed means including a pair of drive arms, means for pivotally mounting said drive arms to said cabinet, a transverse feed bar pivotally mounted on said drive arms, a feeder arm mounted on said transverse feed bar, a lever pivotally mounted to one drive arm controlling the rotation of said transverse feed bar about its axis, a spring controlling the rotation of said lever, at least one needle member on said feeder arm facing said articles; bias means urging said article toward a first end of said hopper, article stop means on said hopper at said first end, an article delivery port provided in said outer cabinet, actuator means having an element extending outside said cabinet and attached to said drive arms, said actuator means moving said drive arms downwardly to a position wherein said lever rotates the transverse feed bar about its axis under urging of said spring to force said needle into said articles on a first stroke of said actuator means, said actuator means being movable to next lift said feeder arm to position wherein the article engaged by said needle is lifted clear of said stop means, stripper means for removing said article from said needle after it has cleared said stop means and is in position to deposit said article adjacent said port, and means for pivoting said transverse feed bar to a position wherein the article lifted by said needle is forced against said stripper means to remove said article from said needle as said drive means are moved by said actuator means to their original position.

12. A vendor for articles having substantially greater width and length than thickness, said vendor including an outer housing, a storage hopper within said housing for retaining said articles on edge, a storage hopper including a deck inclined upwardly toward a first end thereof, said articles being supported on said deck, a pusher plate assembly comprising a pair of arms pivotally mounted on said outer housing above said deck and straddling said deck, a pusher plate slidably mounted on said arms and adapted to engage an article furthest away from the first end of said hopper, said pusher plate and said arms being movable from a first position spaced from the first end of said hopper to a second position at a first end of said hopper, said arms being offset so that the angle between the plane of said deck and the front surface of said pusher plate is less than ninety degrees with said pusher plate and said arms in said first position and with said pusher plate and said arms in said second position the

angle between the plane of said deck and the front surface of said pusher plate is greater than ninety degrees, a separate roller attached to each of said arms adjacent the lower ends thereof and below said pusher plate, a pair of tension springs, each mounted at a first end thereof to an upper portion of one of said arms and passed over the corresponding roller and mounted at a second end thereof to the front portion of said deck, stop means on said deck at said first end thereof, feed means including a feed bar assembly having at least one feeder arm positioned adjacent the first end of said hopper and in alignment with the articles in said hopper, said feeder arm having article engaging means at an outer end thereof, said feed means being movable to position wherein the article engaging means on said feeder arm engages the article positioned against said stop means, said feed means and said feeder arm being further movable to move said engaged articles to position clearing said stop means on said hopper, and means for removing said article from said feeder arm in position wherein the article can be removed from said housing.

13. A vendor for articles having substantially greater width and length than thickness, said vendor including an outer housing, a storage hopper within said housing for retaining said articles on edge, bias means urging said articles toward a first end of said hopper, stop means on said hopper at said first end, feed means including a pair of spaced substantially parallel drive arms pivotally mounted on said outer housing and having outer ends thereof positioned outwardly of the first end of said hopper, a feed bar assembly pivotally mounted between said drive arms at the outer end thereof, and positioned adjacent a first end of said hopper in alignment with the articles in said hopper, said feed bar assembly having a feeding arm with article engaging means at an outer end thereof, a control bracket drivably mounted on said feed bar, a control lever pivotally mounted on one of said drive arms and having a first end thereof pivotally mounted to said control bracket, a spring, a first end of said spring being mounted at a second end of said control lever, said spring extending in direction toward the first end of said control lever, means for mounting a second end of said spring with respect to said outer housing, actuator means connected to said drive arms and adapted to move said drive arms between first and second positions, the mounting of said spring and said control lever being such that the mounting axis of said spring on said housing, the pivotal axis of said control lever on said drive arm, and the mounting axis of said spring on said control lever go over center as said drive arms are moved from their first to their second position, said article engaging means engaging said article under the over center action of said spring and control lever as the drive arms move from said first to said second position, said actuator means being further movable to move said engaged article to position clearing said stop means and said hopper, and means for removing said engaged article from said feed arm operable when said actuator means moves said drive arms from said second to said first position, said article being deposited wherein it can be removed from said housing.

14. A vendor as specified in claim 13 wherein said stop means on said hopper is comprised as a plurality of upright stop members attached to the first end of said deck and extending upwardly, and a separate leaf spring member overlying each of said stop members and extending upwardly beyond said stop member, the upper portions of said leaf springs being biased toward said articles in said hopper.

15. A vendor as specified in claim 14 wherein there are two feeder arms attached to said feed bar, said feeder arms each being independently mounted on said feed bar for limited independent movement toward and away from the articles in said hopper, and bias means between each

of said feeder arms and said feed bar urging the arms toward the articles in said hopper.

References Cited by the Examiner

UNITED STATES PATENTS

2,382,959	8/45	Cameron	221—39
2,444,389	6/48	Wagner	221—215

2,858,047	10/58	Williams et al.	221—227
2,992,756	7/61	Ray	221—213
3,104,781	9/63	Clift	221—215

5 RAPHAEL M. LUPO, *Primary Examiner*.
LOUIS J. DEMBO, *Examiner*.