April 23, 1968 M. W. NEWBERRY 3,379,342

MULTIPLE COLUMN VENDING MACHINE

Filed Feb. 13, 1967 6 Sheets-Sheet 1

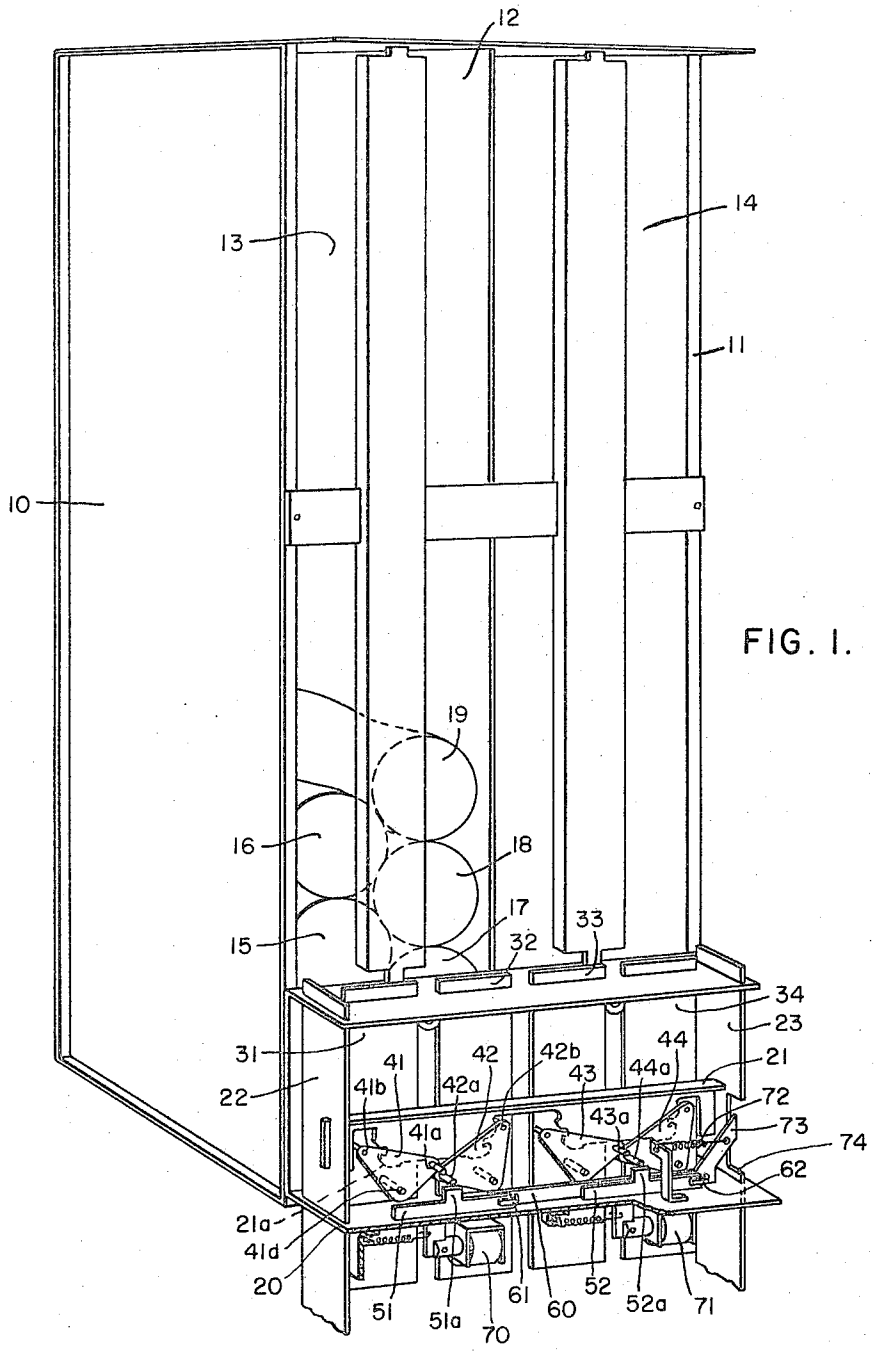


FIG. 1.

WITNESSES

Robert C. Baird

James F. Young

INVENTOR

Meigs W. Newberry.

BY

Francis F. Blake

ATTORNEY

April 23, 1968 M. W. NEWBERRY 3,379,342

MULTIPLE COLUMN VENDING MACHINE

Filed Feb. 13, 1967 6 Sheets-Sheet 2

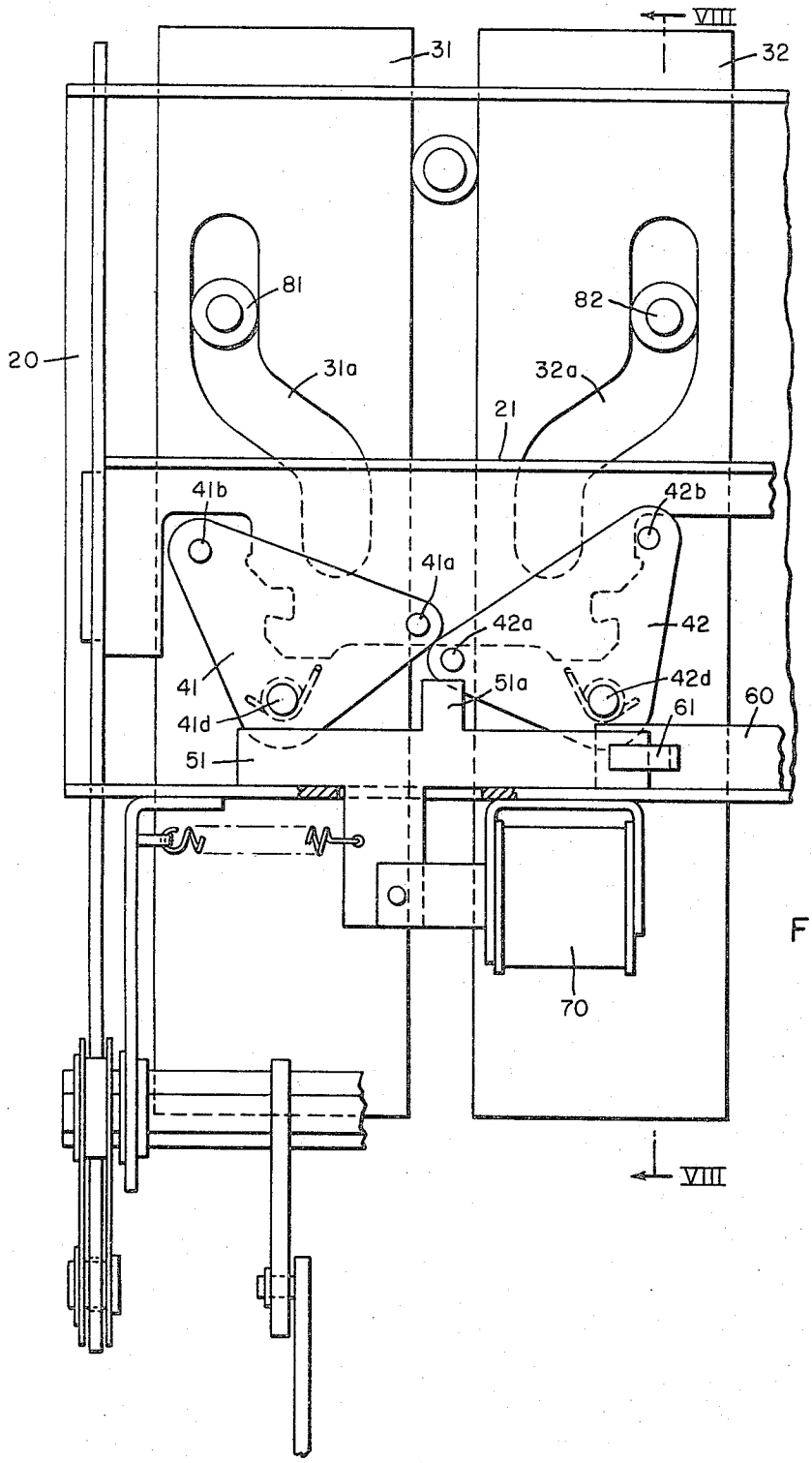


FIG. 2.

April 23, 1968 M. W. NEWBERRY 3,379,342

MULTIPLE COLUMN VENDING MACHINE

Filed Feb. 13, 1967 6 Sheets-Sheet 3

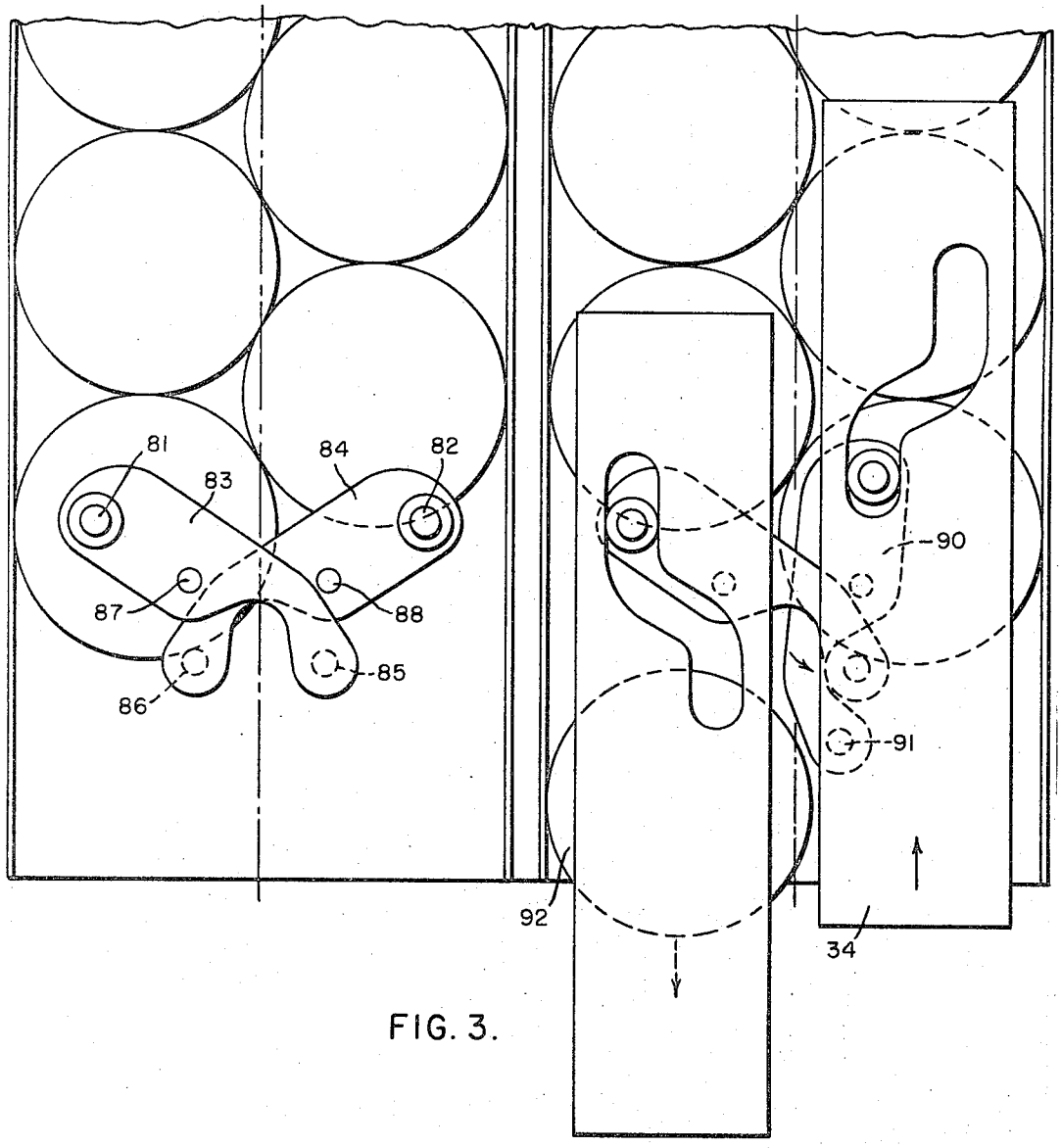
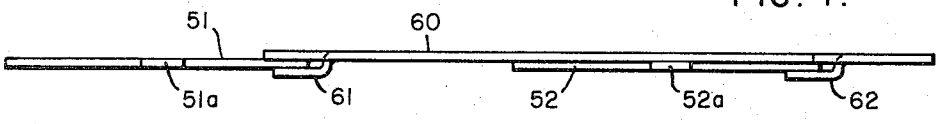


FIG. 3.

FIG. 7.



April 23, 1968 M. W. NEWBERRY 3,379,342

MULTIPLE COLUMN VENDING MACHINE

Filed Feb. 13, 1967 6 Sheets-Sheet 4

FIG. 4.

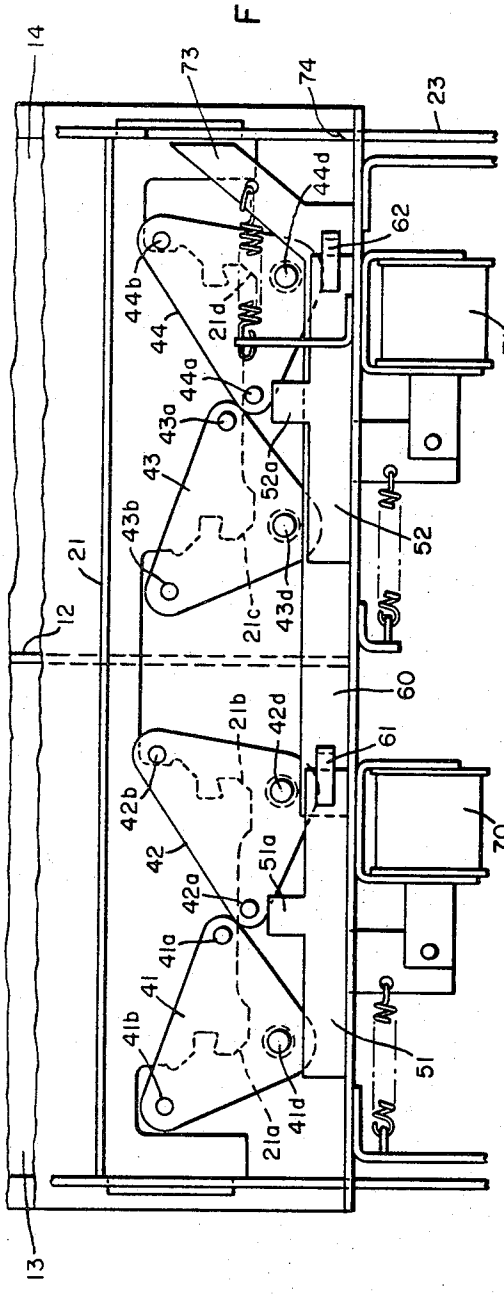
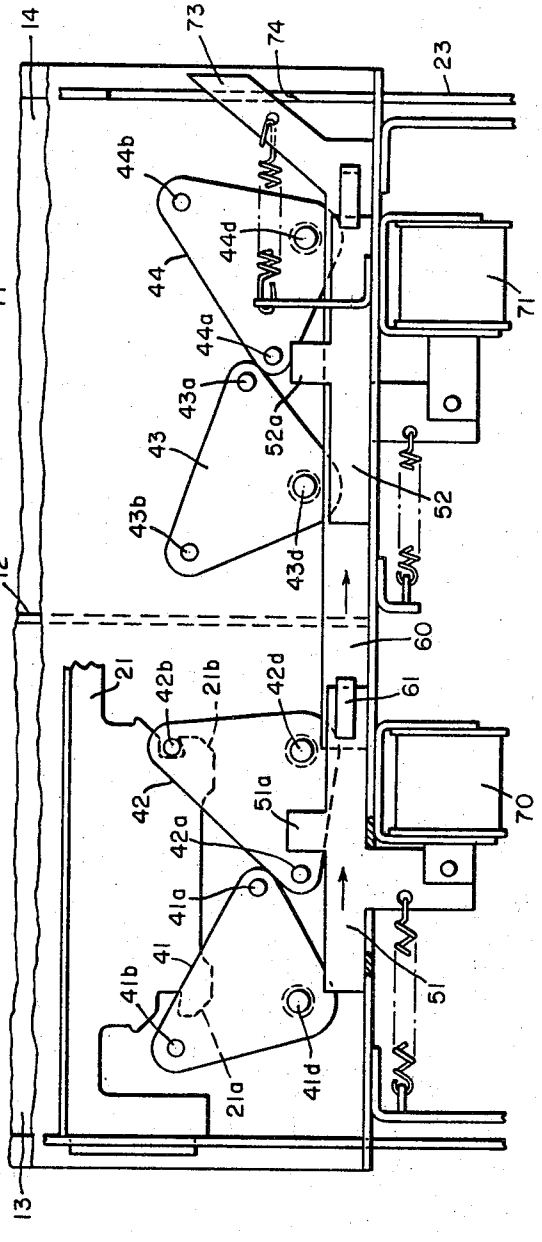


FIG. 5.

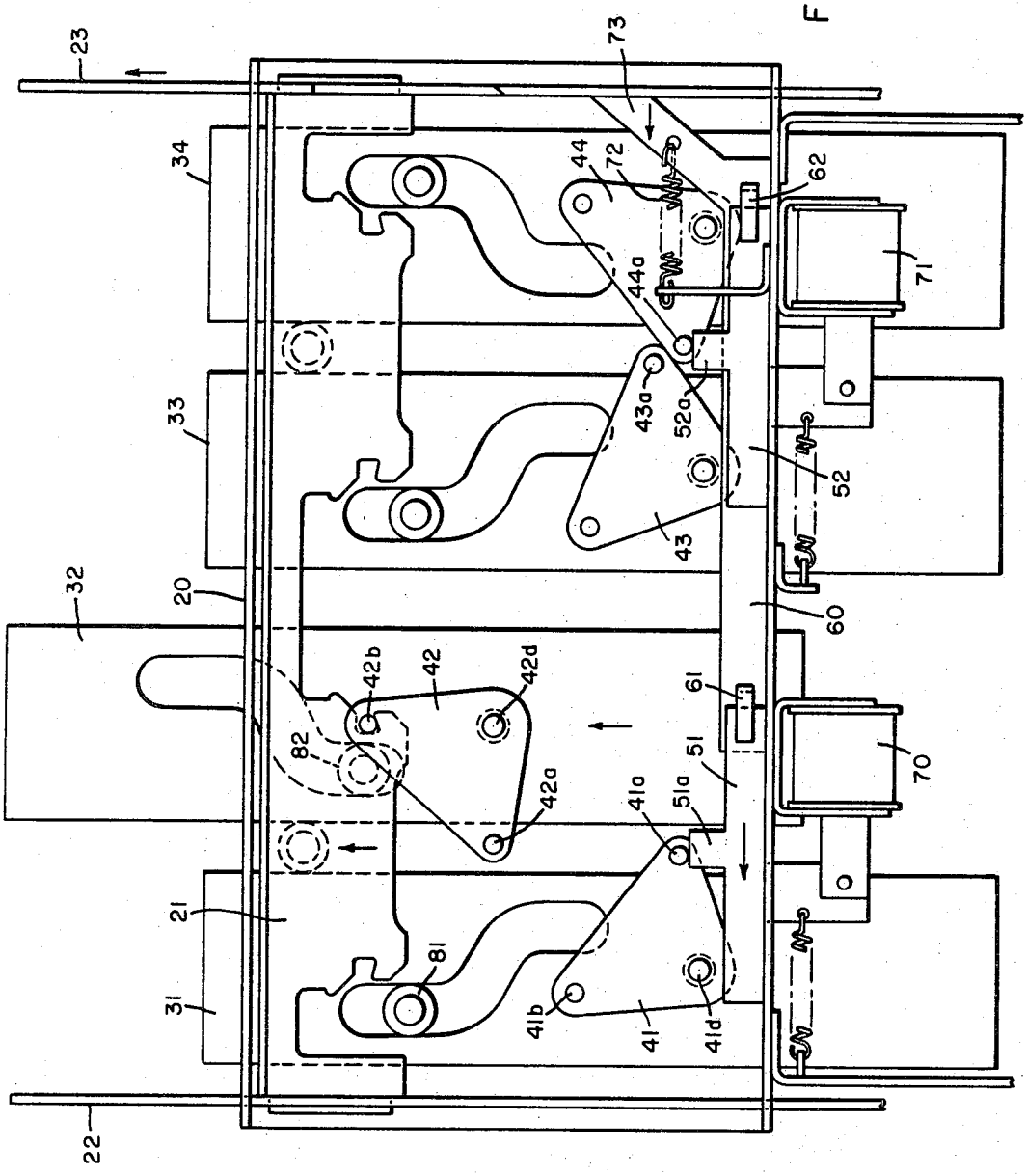


April 23, 1968 M. W. NEWBERRY 3,379,342

MULTIPLE COLUMN VENDING MACHINE

Filed Feb. 13, 1967 6 Sheets-Sheet 5

FIG. 6.



April 23, 1968 M. W. NEWBERRY 3,379,342

MULTIPLE COLUMN VENDING MACHINE

Filed Feb. 13, 1967 6 Sheets-Sheet 6

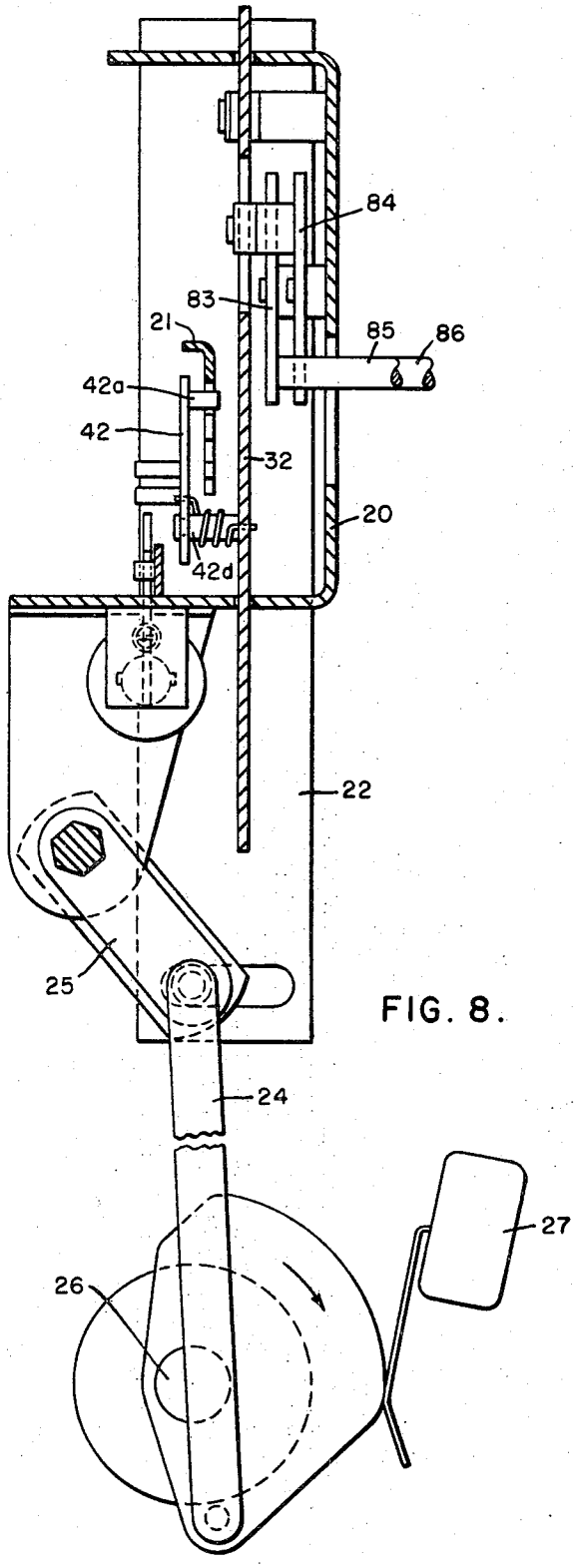


FIG. 8.

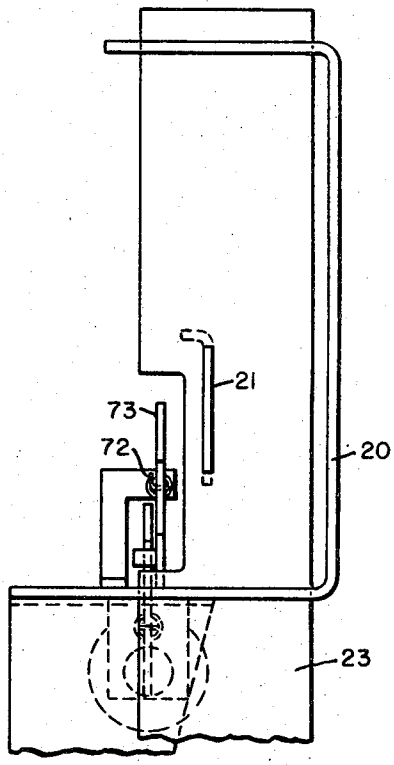


FIG. 9.

United States Patent Office 3,379,342
Patented Apr. 23, 1968

3,379,342

MULTIPLE COLUMN VENDING MACHINE

Meigs W. Newberry, East Longmeadow, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Feb. 13, 1967, Ser. No. 615,516
6 Claims. (Cl. 221—129)

ABSTRACT OF THE DISCLOSURE

A plurality of respective selection control members for the respective gate controlled dispensing mechanisms of a plurality of side-by-side storage columns are selectively and individually actuated to an operated position at the beginning of a vend cycle and a single return mechanism is operable to return any operated one of the selection control mechanisms from the operated position before the end of a vend cycle.

Cross references to related applications

This invention is related to the basic vending mechanism shown in U.S. patent application Ser. No. 434,512, now Patent No. 3,337,088, entitled, Mechanism for Operating Corded Stack Vending Machines, and filed Feb. 23, 1965, in the name of Meigs W. Newberry and assigned to the same assignee as the present application. Although the aforementioned copending U.S. patent application relates to a so-called corded stacked vending machine it should be understood that the mechanism of the present invention including the single return member may be used with any multiple vertical column vending machine and is not limited to a corded stack column type of vending machine. An electrical control circuit which may be used in connection with the mechanism of the subject invention is described in the U.S. patent to Kalista, 3,209,946, issued Oct. 5, 1965, and assigned to the same assignee as the present patent application.

Background of the invention

The invention relates to dispensing mechanisms generally classifiable by the U.S. Patent Office classification in class 221, Article Dispensing, subclass 92, plural sources, stacks or compartments. The most pertinent patented prior art known to applicant is believed to be shown by the U.S. Patent 3,209,945 in the name of F. A. Gasparini, issued Oct. 5, 1965, and assigned to the same assignee as the present invention. Also the aforementioned copending U.S. patent application, Ser. No. 434,512, to which the subject invention may be considered an improvement, is prior art.

Summary

In accordance with the invention, there is disclosed a vertical storage multiple column vending machine having respective individual gate controlled dispensing mechanisms at the lower end of each side-by-side positioned column to be selectively operated for a vending operation or cycle thereby determining from which column the desired merchandise is to be vended. A respective selecting and control member for each dispensing mechanism is provided in aligned positions with each other across the width of the side-by-side positioned vertical columns to be selectively moved from a normal position to an operated position thus enabling the associated dispensing mechanism to be operated during a vending operation and thus determining the selection of a particular column of articles for vending. Individually operated respective power means, such as a solenoid, is provided and associated with each control member to move the control member from the normal position to the operated position at the beginning of the vending operation, and a particular feature of the present invention is the additional provision of a single return member bridging the aligned positions of each control member and associated therewith in such a manner as to return any operated one of the control members to its normal position before the completion of a vending operation. The vending machine provides for a common operating means that is moved during each vending operation and a respective one of the dispensing mechanisms is connected thereto for operation therewith during a vending cycle whenever its associated control member has been moved to the operated position at the beginning of the vend cycle. A feature of the present invention is the provision of an interconnection between the common operating means and the single return member such that the single return member is moved by the movement of the common operating member to return any operated one of the control members to its normal position before the end of the vend cycle.

Brief description of the drawings

FIGURE 1 is a perspective elevational view of the magazine structure for a vertical storage multiple column vending machine with the control mechanism of the invention adjacent the vending gate mechanism at the lower end of the magazine;

FIG. 2 is a front elevation of a lower portion of the dispensing gate mechanisms including some of the operating plates for the vending gates, a movable common operating member, a movable control member and a solenoid operating the control member, and also showing a portion of the single return member for returning the control member to the normal position;

FIG. 3 shows one form of article releasing mechanism or gate as devised for use with a corded stack column of articles to be vended;

FIG. 4 is a view similar to FIG. 2 but showing a portion of two column corded stack magazine with two control members in aligned positions with each other together with a single return member for returning any operated one of the two control members;

FIG. 5 is a view similar to FIG. 4 but showing the left hand control member in the operated position for allowing the gate operating mechanism for column 13 to be coupled to the movable common operating member;

FIG. 6 is a view similar to FIG. 5 but showing the single return member in the returned position as operated by the common operating member before the end of a vend cycle with the previously operated control member from the left hand column returned to its normal position by the movement of the single return member;

FIG. 7 is a fragmentary plan view of the single return member and two control members as seen from above;

FIG. 8 is a section of a line 8 of FIG. 2; and

FIG. 9 is an end view taken to the left of FIG. 4 of the drawings.

Description of the preferred embodiment of the invention

Referring first to FIGURE 1 of the drawings, the general arrangement of a typical corded stack vending machine magazine for which the invention may be used will be described. Although the vending machine as shown is comprised of only two side-by-side vertical storage columns, it will be readily apparent that the invention may be applied to a vending machine magazine having any plural number of vertical side-by-side storage columns. Also the invention is shown as it may be applied to a so-called corded stack magazine structure but again it will be readily apparent that the control mechanism arrangement of the invention may be applied to any type of multiple vertical storage column magazine structure whether the articles are stored in each column in a corded stack or

a single vertical stack. Generally speaking the magazine structure includes the end walls **10** and **11** and an intermediate vertical spacing partition **12** to form the respective storage compartments **13** and **14**, each having a width sufficient to accommodate a plurality of articles such as bottles or cans **15–19** in a corded stack arrangement. Extending across the lower front end of the magazine is a channel member **20** upon which are mounted the movable selecting and control elements of the vending mechanism to be described in more detail. For example, the movable channel **21** is supported by the end plates **22** and **23** respectively which are vertically movable in slots of the fixed channel member **20**. As more clearly shown by FIGS. 2 and 8 of the drawings, the movable channel member **21** which may also be termed a common operating member is vertically reciprocable when the reciprocable end plates **22** and **23** are moved by the operating link **24**, bell crank **25**, and electric motor shaft **26** upon each vending cycle. It should be understood that the electric motor shaft **26** revolves one revolution for each cycle and is controlled by a control circuit not shown to which the cycle switch **27** is connected in an obvious manner. As previously mentioned a typical electrical control circuit that may be used for a vending machine of this type is described in the U.S. patent to Kalista, 2,209,946.

In addition to the movable common operating channel member **21** a plurality of individually reciprocable lifter plates **31–34** are supported by the fixed channel **20** for vertical movement. Each of the lifter plates **31–34** when vertically reciprocated will operate a releasing bar or gate to release a corresponding one of the bottles or cans that may be contained in the vertical storage columns. Stated another way a reciprocal movement of the lifter plate **31** would release a bottle in the left hand side of the corded stack in column **13** provided that the bottle at that time is the lowermost article to be vended. Similarly, a reciprocal movement of the lifter plate **32** would move the release bar or gate to release the lowermost article in the right hand stack of the corded stack of articles in the column **13**. In a similar manner also the lifter plates **33** and **34**, when individually reciprocated, control the release of corded stack articles in the column **14** from the respective stacks left or right as the case may be.

In order to alternately couple a lifter plate such as the lifter plate **31** and lifter plate **32** to the common operating member **21** for movement therewith in the correct sequence to correspond with the lowermost article of the corded stack articles in a given column of articles, an alternator coupling mechanism including the pivotal plates **41, 42** for column **13** and **43** and **44** for column **14** is provided. The operation of the alternator coupling mechanism including the pairs of plates **41–44** is more completely described in the previously mentioned copending patent application Ser. No. 434,512 and will not be described in detail herein except insofar as necessary for an understanding of the present invention. However, still referring to FIG. 1 of the drawings it will be seen that so long as any of the pivotal coupling plates **41–44** are in the positions shown, the vertical reciprocal movement of the common operating member **21** would not result in any vertical movement of any of the lifter plates **31–34**. As shown by FIG. 1 each of the pivotal coupling plates **41–44** is maintained in the uncoupled position by the normal positions of the selection and control members **51** and **52** which are slidably supported in aligned positions with each other on the fixed channel member **20** across the width of the storage columns. With either control member **51** or **52** in the normal position shown, the respective projections **51***a* or **52***a* are in supporting position for either of the lowermost pins **41***a*, **42***a* or **43***a* and **44***a* of the respective coupling members **41–44**. However, should either one of the control member **51** or **52** be moved to the right from their normal positions shown in FIGS. 1, 2 and 4 of the drawings, then the respective coupling member **41, 42** or **43, 44**, whichever one is lowermost with its respective pin **41***a*, **42***a* or **43***a*, **44***a* supported by the projection **51***a* will pivot in a direction to move the lowermost pin downward. Thus when a corresponding one of the coupling members **41–44** is allowed to pivot in a direction to move its associated pin **41***a*–**44***a* downwardly, such coupling member will have moved its corresponding coupling pin **41***b*–**44***b* into a position to engage the respective hook surface **21***a*–**21***d* respectively of the vertically reciprocal common operating member **21**. It should be noted that each of the pivotal coupling members **41–44** is pivotally mounted at respective pivot points **41***d*–**44***d* to the respective lifter plates **31–34**. Thus when a pivotal coupling member such as the pivotal coupling member **42** is allowed to hook to the movable common operating member **21** upon movement of the control member **51** to the right from the normal position shown by FIG. 1 of the drawings, then the lifter plate **32** will be reciprocated upwardly with the common operating member **21** to vend the lowermost article in the right hand stack of corded stack articles in column **13**. During the vend cycle as will be more fully described hereinafter, the control member **51** which had been previously moved to the right from the position shown by FIG. 1 of the drawings will be moved back to the normal position shown in response to the left hand movement of the single return member **60** of the invention having a projection **61** engageable with the left hand control member **51** and a projection **62** engageable with the right hand control member **52**.

A solenoid **70** is provided to operate and move the left hand control member **51** from the normal position shown by FIG. 1 to the right of the drawings while a similar solenoid **71** is provided to move the right hand control member **71** from the normal position shown to the right of the drawings. When either of the solenoids **70** or **71** is operated by the selection control circuit previously referred to as being described in U.S. Patent 3,209,946, a vend will be obtained from either the column **13** or the column **14**. The movement of the associated control member **51** or **52** will correspondingly move the single return member **60** to the right of the drawing. As soon as the respective solenoid **70** or **71** is deenergized during a vend cycle, the return spring **72** will function to move the single return member **60** back to the left of the drawing to return whichever one of the control member **51** or **52** had been moved to the right at the beginning of the vending operation. To aid the return spring **72**, the single member **60** may be provided with an inclined surface end portion **73** so that the underside thereof will be engaged by the notch surface **74** of the reciprocating end plate **23**. As the reciprocating end plate **23** moves upwardly during the vend cycle to carry the common operating channel **21** upwardly, the inclined surface **73** of the single return member **60** is cammed to the left of the drawings to return any one of the previously moved control member **51** or **52** back to the left to the normal position shown by FIG. 1 of the drawings.

Referring to FIG. 2 of the drawings some details not clearly visible in FIG. 1 of the drawings will be apparent. For example each of the lifter plates such as lifter plates **31** and **32** is shown to have respective slots **31***a* and **32***a* engageable with respective release rollers **81** and **82** of the left and right hand stacks of the corded stack of articles in column **13**. Thus, when a respective lifter plate **31, 32** is reciprocated vertically a respective one of the release rollers **81** and **82** will be moved generally horizontally. Reference may be made to FIG. 3 of the drawings which show in further detail the arrangement for the release bars which include the previously mentioned roller elements **81** and **82** engageable in the respective slots **31***a* and **32***a* to be mounted on the respective toggle levers **83** and **84** carrying the supporting and release rods **85** and **86** respectively at their lower ends. It should be understood that the releasing toggles such as **83** and **84** are pivotally

supported at points 87 and 88 respectively to the fixed magazine structure in a manner not shown in detail.

As more clearly shown by FIG. 3 of the drawings, when the lifter plate such as the lifter plate 34 is reciprocated upward, the toggle lever such as the toggle lever 90 will be rotated counterclockwise to remove the support rod 91 from supporting position beneath the lowermost article such as the bottle 92 in the left hand stack of the corded column of articles contained in column 14.

Reference may be made to FIGS. 4–7 of the drawings for a more detailed understanding of the operation by which a respective one of the alternator coupling members 41–44 is alternately coupled selectively to the common operating member 21 during a vend cycle. FIG. 4 of the drawings shows both of the control members 51 and 52 in the normal positions such as to prevent any of the alternator coupling plates 41–44 from becoming hooked to a respective one of the hook projections 21*a*–21*d* of the vertically reciprocal common operating member 21.

FIG. 5 shows the control member 51 moved to the right of the drawing by the energization of solenoid 70 at the beginning of vend cycle to enable the alternator coupling member 42 to move counterclockwise and allow its pin 42*b* to engage the hook surface 21*b* of the vertically reciprocal member 21 as the vertical reciprocal member 21 begins to move upwardly. Thus the movement of the vertical reciprocating common member 21 upwardly carries the alternator coupling plate 42 upwardly with it and since the plate 42 is pivotally secured at 42*d* to the lifter plate 32, the lifter plate 32 will accordingly be moved upwardly to operate the releasing bar for the right hand article in the corded stack of articles in the vertical column 13.

FIG. 6 of the drawings shows the lifter plate 32 in the fully raised position while it is hooked to the common operating member 21 also shown in the fully raised position. It is important to note that in FIG. 6 of the drawings the single return member of the invention has been moved to the left in the direction of the arrows to thereby return the previously moved control member 51 back to its normal position supporting the left hand alternator coupling plate 41 in a disengaged position. It may aiso be clearly seen how the camming action on the inclined projection 73 of the single return member 60 aids the return spring 72 in moving the single return member 60 to the left of the drawing as the common operating member 21 is moved vertically upward.

At the completion of the vend cycle, when the common operating member 21 has again moved vertically downward to its normal position carrying with it the coupling plate 42 and the lifter plate 32, the respective pins 41*a* and 42*a* will have exchanged positions from that shown in FIGS. 1, 4 and 5 of the drawings. Therefore, the next time that the solenoid 70 is operated for a subsequent vend cycle, the coupling member 41 instead of the coupling member 42 would be allowed to connect to the common operating member 21 to thereby lift the lifter plate 31 instead of the lifter plate 32 thus securing the release of the lowermost article in the left hand stack of the corded stack column 13. In other words each time that the solenoid such as solenoid 70 or 71 is operated for a vend cycle the associated coupling plate such as coupling plates 41 and 42 for solenoid 70 or coupling plates 43 and 44 for solenoid 71 will alternately exchange positions to secure the alternate operation of the support and release rods under the lowermost article in the corded stack of articles.

It should now be apparent that when merchandise is desired to be vended from the left hand column 13 the solenoid 70 must be energized at the beginning of the vending operation to move the selection control member 51 to the right of the drawings. Should merchandise be desired from the column 14 however then solenoid 71 should be operated to move the associated selection control member 52 to the right from the normal position shown by FIGS. 1 and 4 of the drawings. Nothwithstanding which of the control members 51, 52 has been moved to the right, the single return member 60 of the invention is effective to return the operated one of the control members 51 and 52 back to the normal position during vending operation in time to return to supporting relation beneath the lowermost one of the respective pins 41*a*, 42*a*, 43*a*, 44*a* of the respective alternator coupling plates 41–44.

Various modifications may be made within the spirit of the invention.

What is claimed is:

1. A vending machine comprising a magazine structure having a plurality of vertical storage columns and dispensing mechanisms arranged in side-by-side positions, a plurality of respective control members arranged in aligned positions across the width of the dispensing mechanisms and each adapted to be moved from a normal position selectively in one direction along the path of alignment to an operated position to control the operation of a respective dispensing mechanism at the beginning of a vending cycle, individual selecting means to move a single control member in the one direction at the beginning of a vend cycle to enable the operation of a respective dispensing mechanism, and a single return means to move any previously moved control member in the opposite direction back to the normal position before the end of a vend cycle.

2. The invention of claim 1 in which there is provided a common operating means for said dispensing mechanism and any one of said control members when moved is effective to cause the respective connection of a selected dispensing mechanism to said common operating means for operation thereby during a vend cycle.

3. The invention of claim 2 in which the individual selecting means is operated by individually energized solenoids connected thereto and the single means is mechanically connected to said common operating means to be operated in response to movement of said common operating means during a vend cycle.

4. The invention of claim 1 in which individually energized solenoids are connected to operate individual ones of said individual selecting means.

5. The invention of claim 1 in which the individual selecting means is mechanically connected to individual solenoids to be selectively energized at the beginning of a vend cycle, resilient means interconnecting said magazine structure and each of said control members to normally urge each of said control members to the normal position, means to mechanically operate said single means during a vend cycle, and resilient means interconnecting said magazine structure and said single means to normally urge said single means to move any previously moved control member in the opposite direction in addition to the mechanical operating means therefor.

6. The invention of claim 2 in which the individual selecting means is mechanically connected to individual solenoids to be selectively energized at the beginning of a vend cycle, resilient means interconnecting said magazine structure and each of said control members to normally urge each of said control members to the normal position, means to mechanically operate said single means during a vend cycle, and resilient means interconnecting said magazine structure and said single means to normally urge said single means to move any previously moved control member in the opposite direction in addition to the mechanical operating means therefor.

References Cited

UNITED STATES PATENTS

3,175,728	3/1965	Lindsey et al.	221—295 X
3,231,129	1/1966	Craven et al.	221—295 X

STANLEY H. TOLLBERG, *Primary Examiner.*