United States Patent [19]

Fessler

[11] **3,796,345**

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[54] **DISPENSING MECHANISM FOR ARTICLES IN TWO ABUTTING FRONT TO BACK STACKS**

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[52] **U.S. Cl.** **221/67**

[51] **Int. Cl.** **G07f 11/10**

[58] **Field of Search** 221/67, 112, 116

[56] **References Cited**

UNITED STATES PATENTS

3,300,084	1/1967	Payne	221/67 X
3,203,588	8/1965	O'Neal	221/67

Primary Examiner—Robert B. Reeves
Assistant Examiner—Thomas E. Kocovsky
Attorney, Agent, or Firm—Henderson & Strom

[57] **ABSTRACT**

An article vending mechanism includes a frame that supports a front stack of staggered articles, such as beverage cans, and a rear stack of staggered articles in a single vertical column, a pair of horizontal rods being respectively beneath the rows of such stacks and pivotable alternately in an arcuate path under the control of motor-driven cam means, a storage shelf pivoted beneath the front stack under the control of a motor-driven cam means and out of phase with the movement of the horizontal rods, anti-theft means being provided beneath the rear stack of staggered articles and pivotable out of its normal position each time that either of the horizontal rods is pivoted.

1 Claim, 8 Drawing Figures

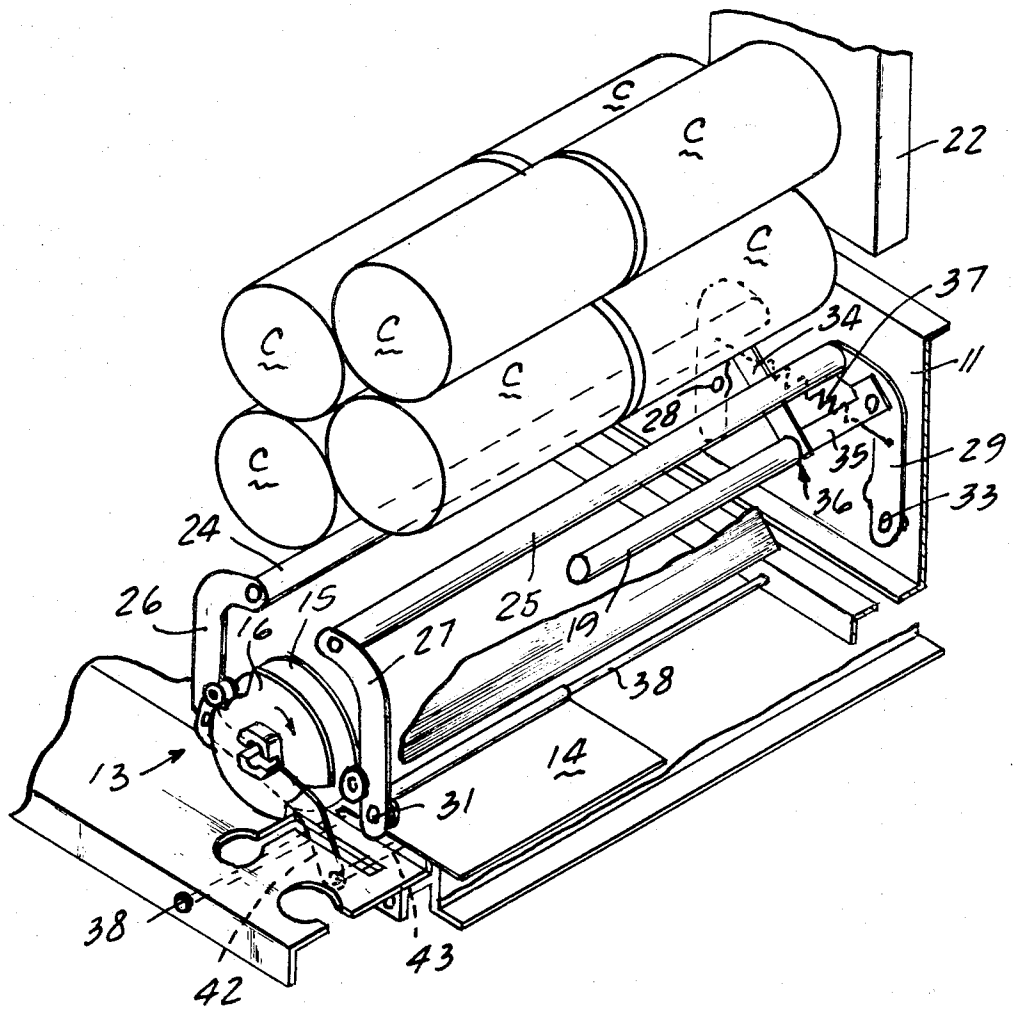


Fig. 1

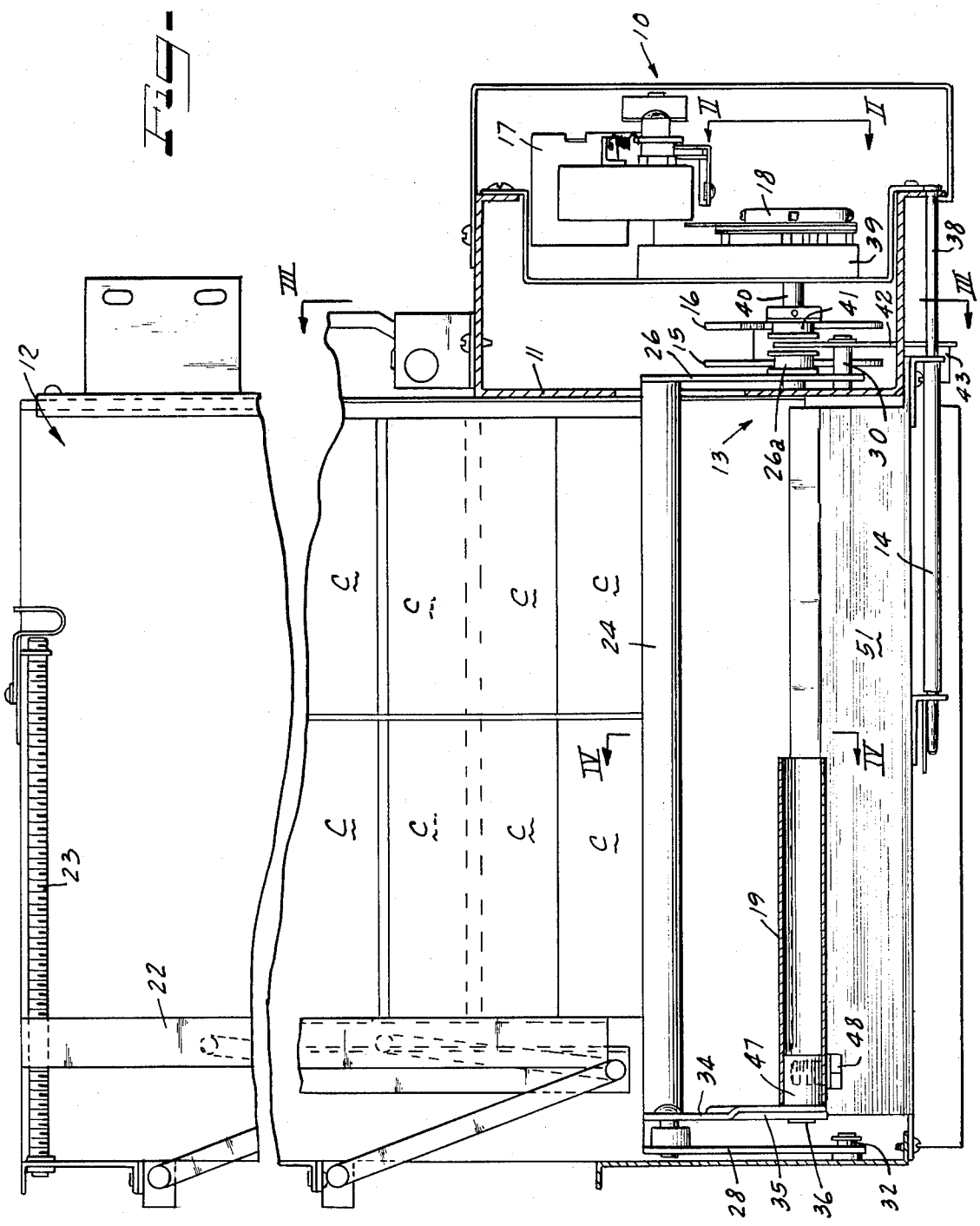

10
17
II
II
18
39
38
III
III
16
40
41
42
26
15
11
12
43
13
26a
30
14
24
51
IV
IV
23
19
22
48
47
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36
32

Fig. 2

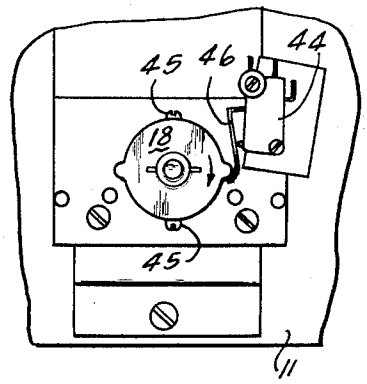


Fig. 3

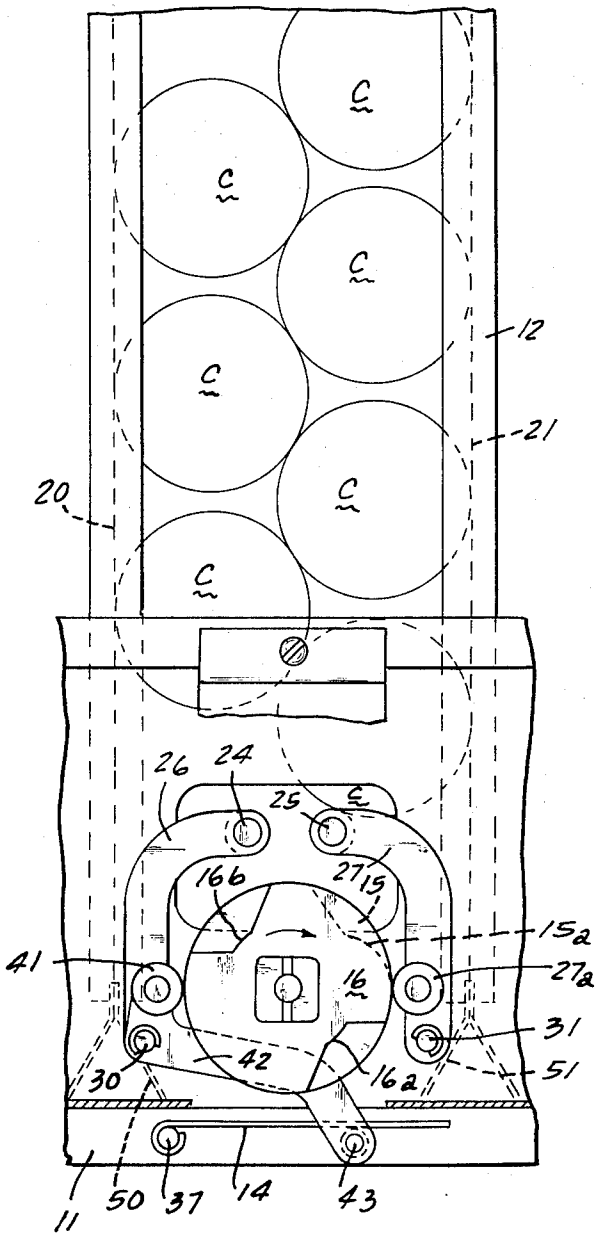


Fig. 4

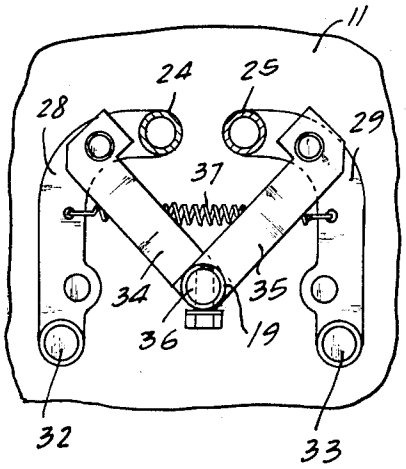


Fig. 5

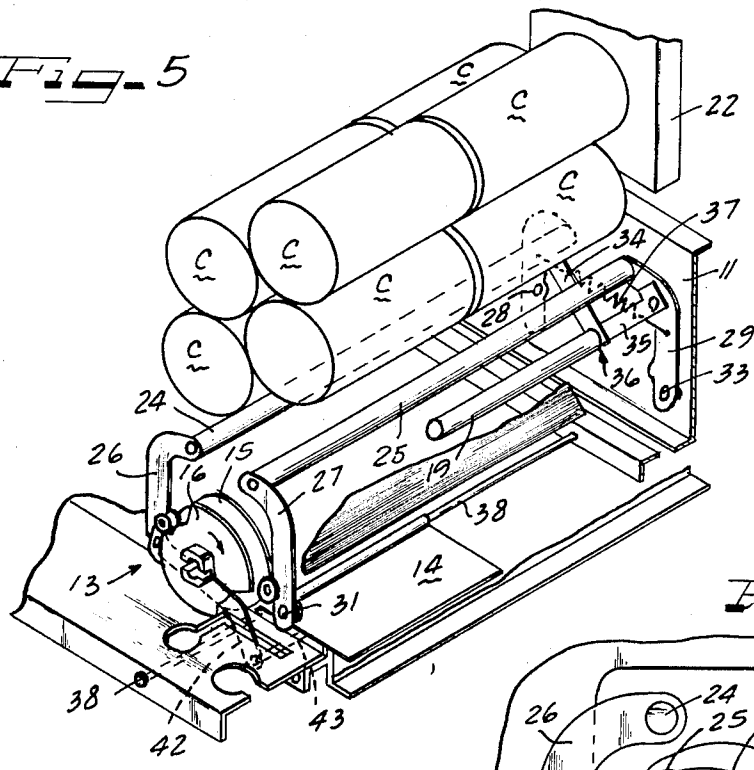


Fig. 6

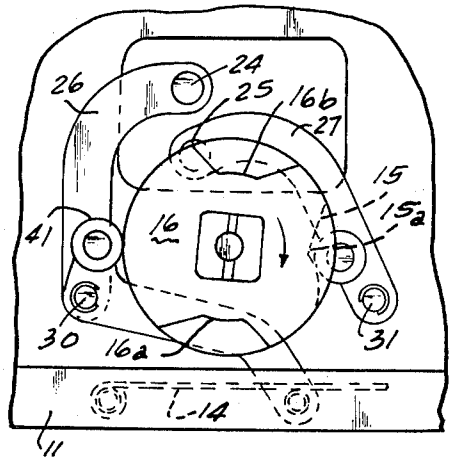
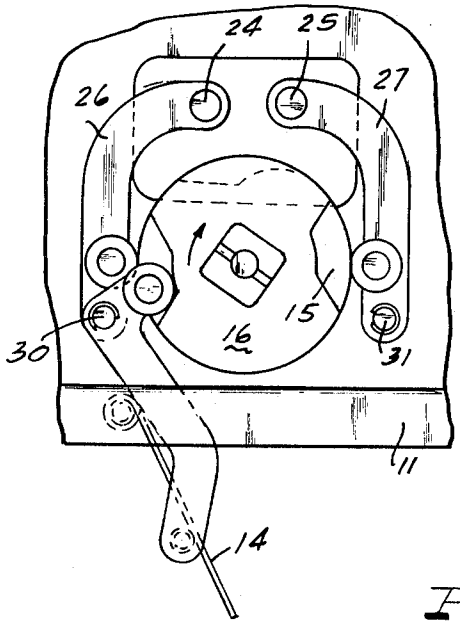


Fig. 7



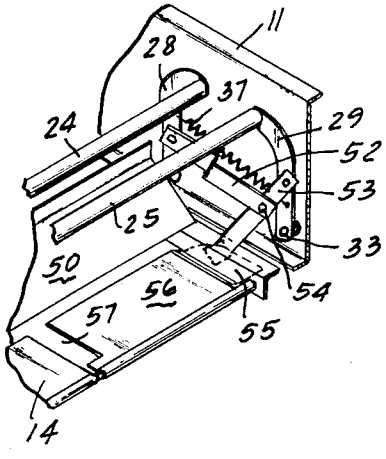


Fig. 8

DISPENSING MECHANISM FOR ARTICLES IN TWO ABUTTING FRONT TO BACK STACKS

BACKGROUND

This invention pertains to an article vending mechanism, and more specifically to a power-operated mechanism for releasing one article at a time from two stacks of staggered articles within a single vertical column.

PRIOR ART

It has been known heretofore to use a plurality of stacks of staggered articles in a single vertical column, for instance such as taught in U.S. Pat. No. 3,454,192. However, once such a mechanism is placed in service, it is not practical to convert that device to dispensing bottles. It has also been known heretofore to provide an escrow shelf beneath a bottle release mechanism such as shown in U.S. Pat. No. 3,203,588. However, that mechanism is not readily convertible by the users thereof to one that can dispense from a plurality of stacks of cans.

SUMMARY OF THE INVENTION

The present invention is directed to an article vending mechanism for dispensing from a plurality of stacks of staggered articles such as cans, but which is convertible to a mechanism that can handle bottles of approximately twice the length of such cans, such conversion being readily facilitated by the user of the machine by virtue of the nature of the construction of the release mechanism itself.

Accordingly, it is an object of the present invention to provide an improved article vending mechanism.

A further object of the present invention is to provide an article vending mechanism for articles such as cans that is convertible to an article vending mechanism for articles such as somewhat longer bottles.

A further object of the present invention is to provide an article vending mechanism that can dispense from the bottom of two stacks of staggered articles wherein each stack has two rows of superimposed articles.

A still further object of the present invention is to provide theft prevention means in an article vending mechanism usable with cans.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which preferred structural embodiments incorporating the principles of the present invention are shown by way of illustrative example.

ON THE DRAWINGS:

FIG. 1 is a side elevational view, partially broken away and partially in cross section, of an article vending mechanism provided in accordance with the principles of the present invention;

FIG. 2 is a fragmentary elevational view taken substantially at line II—II of FIG. 1;

FIG. 3 is a fragmentary elevational view with certain parts removed, taken substantially at line III—III of FIG. 1;

FIG. 4 is a fragmentary cross-sectional view taken at line IV—IV of FIG. 1;

FIG. 5 is a fragmentary perspective view, with certain stationary parts removed, of the structure shown in FIG. 3 that is provided for a single vertical column;

FIG. 6 is a fragmentary view of a portion of FIG. 3 showing operation of the releasing means;

FIG. 7 is a view of a portion of FIG. 3 showing operation of the storage shelf means; and

FIG. 8 is a fragmentary perspective view corresponding to FIG. 5 but showing a modified anti-theft means.

AS SHOWN ON THE DRAWINGS

The principles of the present invention are particularly useful when embodied in an article vending mechanism such as illustrated in FIG. 1, generally indicated by the numeral **10**. The article vending mechanism **10** includes a frame **11** to which there is secured supporting means **12** that define a number of vertical columns, releasing means **13** supported on the frame beneath each of the vertical columns, storage shelf means **14** disposed beneath the column and toward the front of the mechanism, motor-driven cam means **15,16** driven by a motor **17**, a control cam **18** which in this embodiment is corotatable with the cam means **15,16**, and anti-theft means **19** disposed to the rear of the column.

As best seen in FIG. **3**, the supporting means **12** in this embodiment comprises a pair of spaced walls **20,21** which are further apart than the diameter of the various articles C but which are less than twice such diameter apart so that the articles C are disposed therein in a conventional staggered fashion. Although only one article vending mechanism **10** is shown in association with a single vertical column, it should be understood that a number of such mechanisms is provided corresponding to the number of columns desired and hence the capacity and versatility of a particular machine in which the article vending mechanism **10** is embodied. As seen in FIGS. **1** and **3** there is a front stack of staggered articles C disposed in two rows, one row of articles touching the wall **20** and the other touching the wall **21**. As seen in FIG. **1**, there is a second or rear stack of staggered articles also comprising two rows, the articles of one stack being directly aligned with the articles of the other stack. The supporting means **12** includes structure at the front and rear of the column, the structure **22** at the rear being adjustable by means of a screw **23** so that the front-to-rear distance of the column slightly exceeds the combined length of the articles in the two stacks.

The releasing means **13** includes a pair of horizontal rods **24,25**, each rod **24,25** being provided with a support arm **26–29** at its ends, the support arms **26–29** being pivotally secured to the frame **11** as at **30–33** respectively to enable the horizontal rods **24,25** to pivot in arcuate paths. Each of the rods **24,25** is provided with a link **34,35** secured to the corresponding support arm **28,29**. A pivotal connection **36** is provided between the links **34,35**. A spring means **37** draws the support arms **28,29** together to bias the support arms **26,27** toward the motor-driven cam means **15,16**.

The storage shelf means **14** is pivoted to the frame as at **38** and is disposed beneath the releasing means **13**, and more particularly is disposed beneath the front stack of staggered articles. Thus when an article is released from the front stack it receives and supports it. Yet, it is of such length as best in seen in FIG. **1** that

an article released from the rear stack of articles will not be obstructed by the storage shelf means 14.

The motor 17 has a gear train 39 with an output shaft 40 drivably connected to rotate the motor-driven cam means 15,16 and the control cam 18. The control cam 15 has an operating portion 15*a* which, as shown in FIG. 3, is about to be engaged by a cam follower 27*a* forming part of the support arm 27 which enables the support arm 27 to pivot as shown in FIG. 6. When the cam 15 has rotated 180°, the support arm 26 has pivoted to the right in the manner illustrated for the support arm 27, When such pivoting takes place, one of the horizontal rods 25 passes beneath the horizontal rod 24 to enable the articles engaging the rod 25 to pass between the rod 25 and the wall 21, and just before doing so, lowering both rows, the opposite row of articles becoming wedged between the horizontal rod 24 and the wall 20, after which the cam 15 restores the support arm 25 to the position shown in FIG. 3.

The motor-driven cam 16 has two operating portions 16*a*, 16*b* which as clearly shown in FIG. 3, are 90° out of phase with the portion 15*a*. However, the cam 16 coacts with a single cam follower 41 carried on a bell crank 42, also pivoted at the pivotal connection 30, and having a rearwardly extending projection 43 which passes beneath the storage shelf means 14 to support it. During operation by the cam 15 as shown in FIG. 6, the cam portions 16*a* and *b* are remote from the cam follower 41 that is substantially concentric with the cam follower 26*a* (FIG. 1) on the support arm 26. Thus for one revolution of the output shaft 40 of the motor 17, and thus for one revolution of the motor-driven cam means 15, 16, the horizontal rod 25 is pivoted from the position shown in FIG. 3 to the position shown in FIG. 6 and returned, the storage shelf means 14 is pivoted from the position shown in FIG. 3 to the position shown in FIG. 7 and returned, the horizontal rod 24 is pivoted to the right to the vend position and returned to the position shown in FIG. 3, and the storage shelf means 14 is pivoted a second time as described.

Operation of the motor 17 is initiated normally by the deposit of the proper coinage which closes a switch (not shown) to bring power to the motor 17 as is conventional. Rotation of the output shaft 40 also rotates the control cam 18 shown in FIG. 2 to operate a switch 44 disposed in a holding circuit for maintaining power to the motor 17. Two of the lobes 45,45 comprise removable screws, and when any of the lobes engages the actuator 46 of the switch 44, the circuit is broken to complete one vending operation.

The anti-theft means 19 in the embodiment of FIGS. 1, 4 and 5 comprises a cylindrical rod or extension which projects from the pivotal connection 36, parallel to the rods 24,25. As seen in FIG. 1, the gap defined by the right end of the anti-theft means 19 and the rear edge of the storage table 14 is smaller than the end of the can or article supported on the storage shelf 14. This makes it impossible for anyone to reach up through the discharge opening of the cabinet of the machine (not shown) to wrongfully remove any article resting on the storage shelf 14. The pivotal connection 36 includes a stub shaft 47 that projects toward the front of the machine over which the anti-theft means or cylindrical extension 19 is disposed and fixedly secured such as by a screw 48. It can be seen that as the horizontal rod 25 pivots to the left as shown for the rod 25 in FIG. 6, the anti-theft means or rod 19 likewise shifts to the left, and when the horizontal rod 24 is shifted to the right, the anti-theft means or rod 19 shifts correspondingly to the right to enable an article to pass by the rear of the storage shelf 14. Thus the anti-theft means 19 pivots out of its illustrated normal position each time that the horizontal rods 24,25 of the releasing means 13 are shifted to a vend position.

It takes four vend cycles and thus the vending of four articles to go through one complete cycle of the article vending mechanism 10. In the first vend cycle, beginning with the relationship in FIG. 3, the horizontal bar 25 releases the bottom article in both the front and rear stack from the right rows thereof. The front article becomes guided by converging wall portions 50,51 and comes to rest on the storage shelf means 14 while the rear article clears the storage shelf means 14 and the anti-theft means 19. This step entailed movement of the components from the position illustrated in FIG. 3 to that in FIG. 6 and then further rotation to that shown in FIG. 5 wherein the position of the anti-theft means 19 is restored and the left row of both stacks of articles becomes supported on the horizontal support rod 24. In the next vend cycle the horizontal rods 24,25 are not shifted but the storage shelf means 14 is moved from the position shown in FIG. 3 to that shown in FIG. 7 and restored. The next vend cycle shifts the horizontal rod 24 laterally to the right to effect vending of the rear article and storage of the front article, and the fourth vend cycle releases the article stored on the storage shelf means 14 as explained before.

The structure of FIG. 8 includes a different link 52,53 for the support arms 28,29 and which also have a pivotal connection as at 54. However, the link 53 extends beyond the pivotal connection 54 to a point underneath a ledge 55 which forms a part of an anti-theft shelf 56 that is pivoted on the frame and which cannot pivot upwardly from the position illustrated. When the horizontal rod 25 shifts to the left it drives the link 53 in a counterclockwise direction about the connection 54 which serves as a fulcrum, thus shifting the underhanging portion of the link 53 generally toward the viewer to enable the shelf 56 to pivot downwardly. When the horizontal rod 24 is shifted to the right, the lever 53 pivots about its connection with the support arm 29, thus shifting the pivotal connection 54 to the right to obtain a corresponding result.

The shelf 56 can be disassembled from the structure illustrated and reassembled in an inverted position so that the ledge 55 overlaps the storage shelf means 14. A cutout portion 57 provides clearance with respect to the lower end of the link 53 whereby the shelf 56 is governed by the shelf 14 and not the links 52,53. When the apparatus is used in such a manner, the removable lobes or screws 45,45 are removed to enable the mechanism to be utilized with a bottle that has a length approximately equivalent to that of two of the cans C.

With the structure of FIGS. 1 and 5, in order to vend such bottles, the anti-theft means 19 is physically disassembled from the stub shaft 47 and the removable lobes 45,45 are removed from the control cam 18. When this mechanism is used as a bottle vender, one complete revolution of the motor-driven cam means 15,16 is produced by two vend cycles.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon, all such embodiments as rea-

sonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. An article vending mechanism comprising:

a frame having a pair of upright side walls, an upright front wall, and an upright rear wall, said front and rear walls interconnecting said side walls and spaced sufficiently that two articles can extend end-to-end therebetween, said side walls spaced apart a distance less than the combined widths of said articles such that front and rear stacks of articles are arranged in staggered formation, the articles of the front stack engaging the articles of the rear stack;

article release means including a pair of laterally spaced rods pivotally mounted to said frame and extended between said front and rear walls, each rod disposed below a stack for supporting said articles within said stack, said rods movable laterally alternately each from an article holding position to an article releasing position such that a pair of abutting articles are released for vending with each lateral movement of each rod;

a shelf pivotally mounted at one end only to said front wall and disposed below only the front stack of articles, said shelf operable in one position to catch and hold an article dropped from said front stack by movement of each of said rods and in another position to release the article held;

an anti-theft member mounted to said article release means and disposed below only the rear stack of articles to block manual access to said shelf, said member movable away from beneath said rear stack in response to lateral movement of said rod; and

customer actuated electric means operably connected to said rods and to said shelf for moving said rods and shelf in sequential relationship to each other such that each customer actuation effects a release of an article from the vending mechanism.

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