United States Patent

Sierk et al.

[15] **3,698,601**

[45] **Oct. 17, 1972**

[54] **MAGAZINE FOR DISPENSING MACHINE**

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[21] Appl. No.: **165,190**

[52] **U.S. Cl.** .....**221/105**, 221/117, 221/133, 221/150 A

[51] **Int. Cl.** **B65h 3/40**

[58] **Field of Search**.....221/104, 105, 116, 117, 121, 221/122, 133, 150 A

[56] **References Cited**

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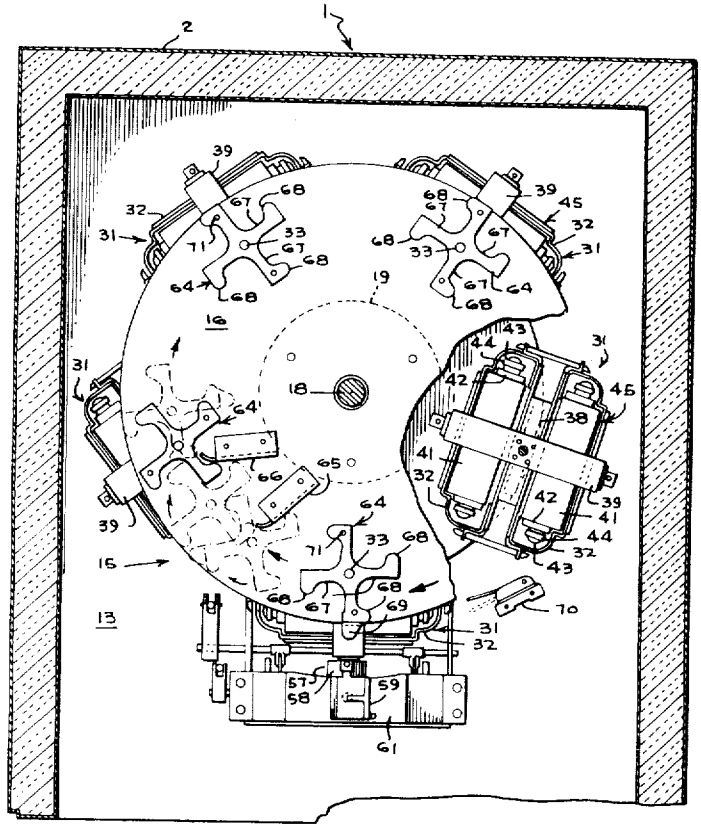
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Assistant Examiner—Reinhold W. Thieme
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[57] **ABSTRACT**

A multiple magazine turret for packaged articles to be dispensed, which is rotatable step by step to bring each magazine to a dispensing position. Each magazine includes parallel racks arranged back to back upon a pivot shaft with means to releasably hold the racks in predetermined positions. Cams are placed to cause rotation of the magazines about their pivot shafts as the turret moves step by step to move empty racks out of dispensing position and replace them with full ones. After two revolutions of the turret and depletion of all racks, the operation is stopped automatically. Each rack is tiltable from its dispensing position for loading, and the individual racks are removable from the turret and the turret is removable as a whole from a dispensing cabinet in which it is operative.

12 Claims, 9 Drawing Figures



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SHEET 1 OF 6

Fig-1

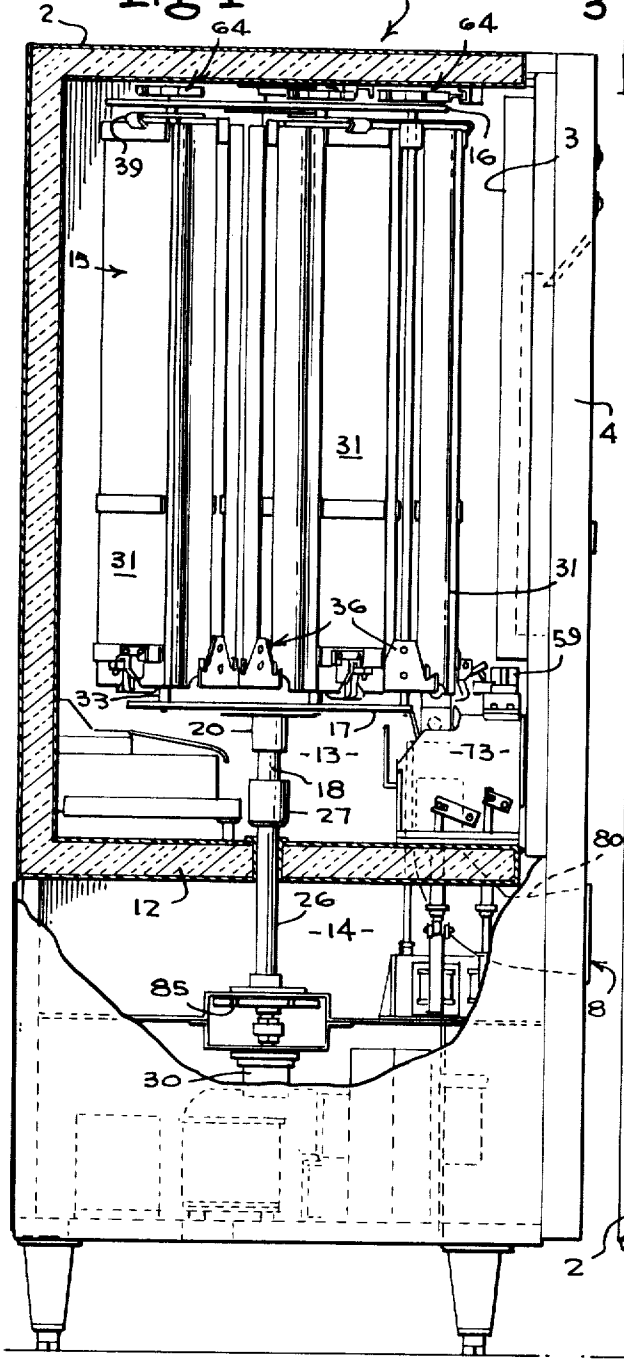
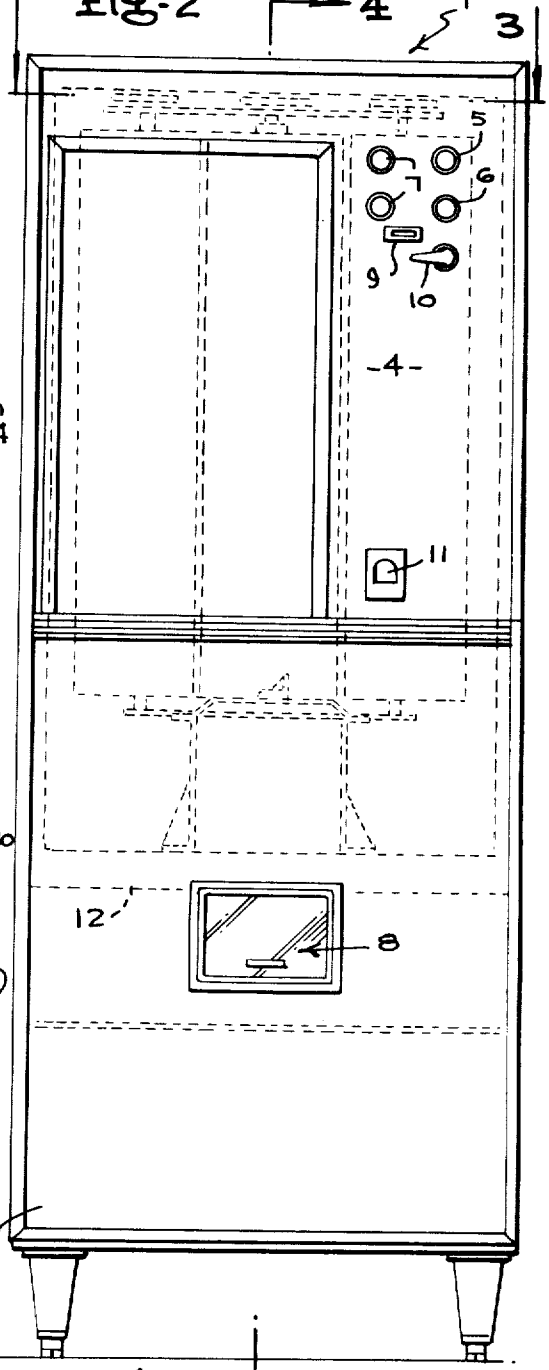


Fig-2



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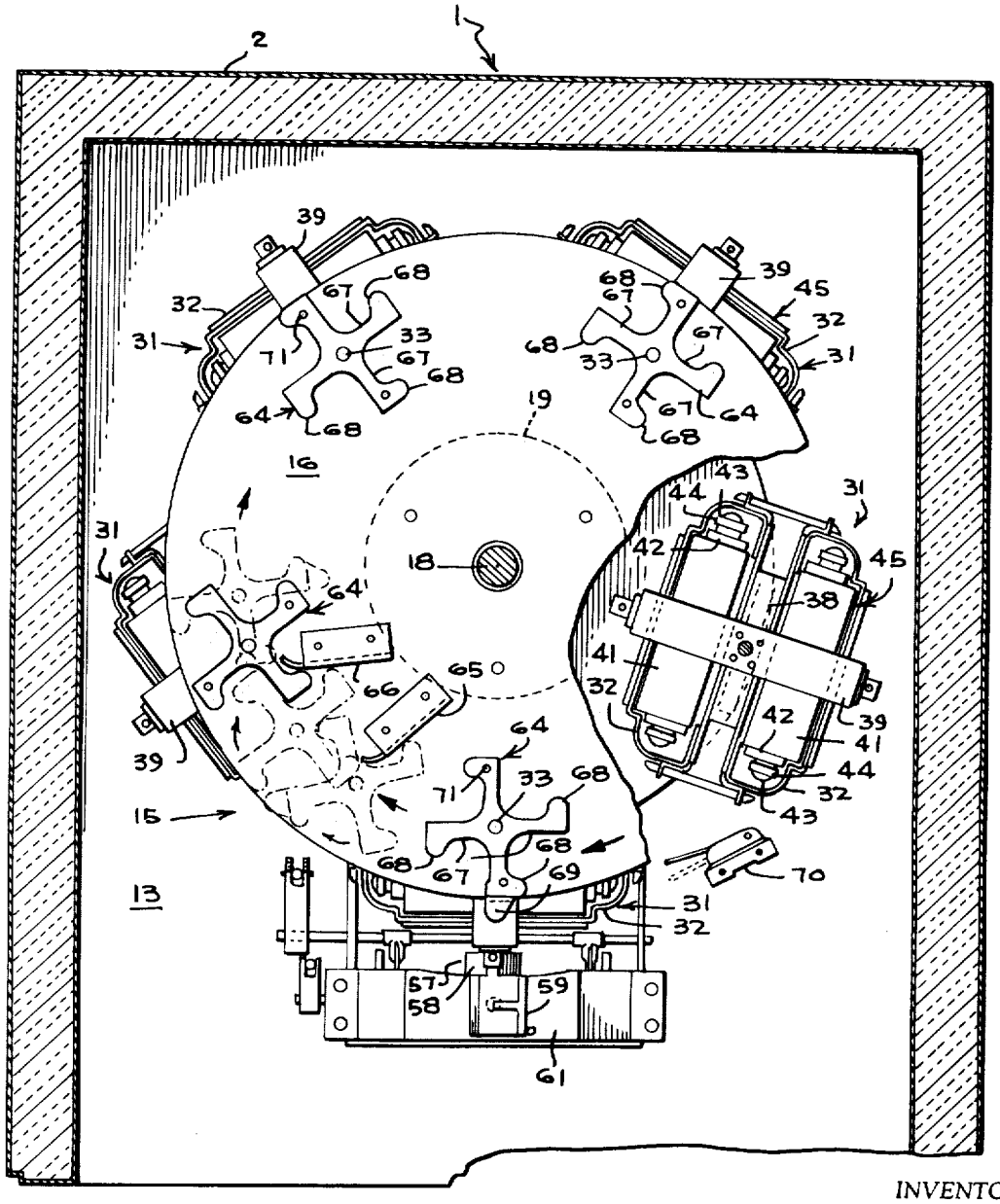
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Fig-3



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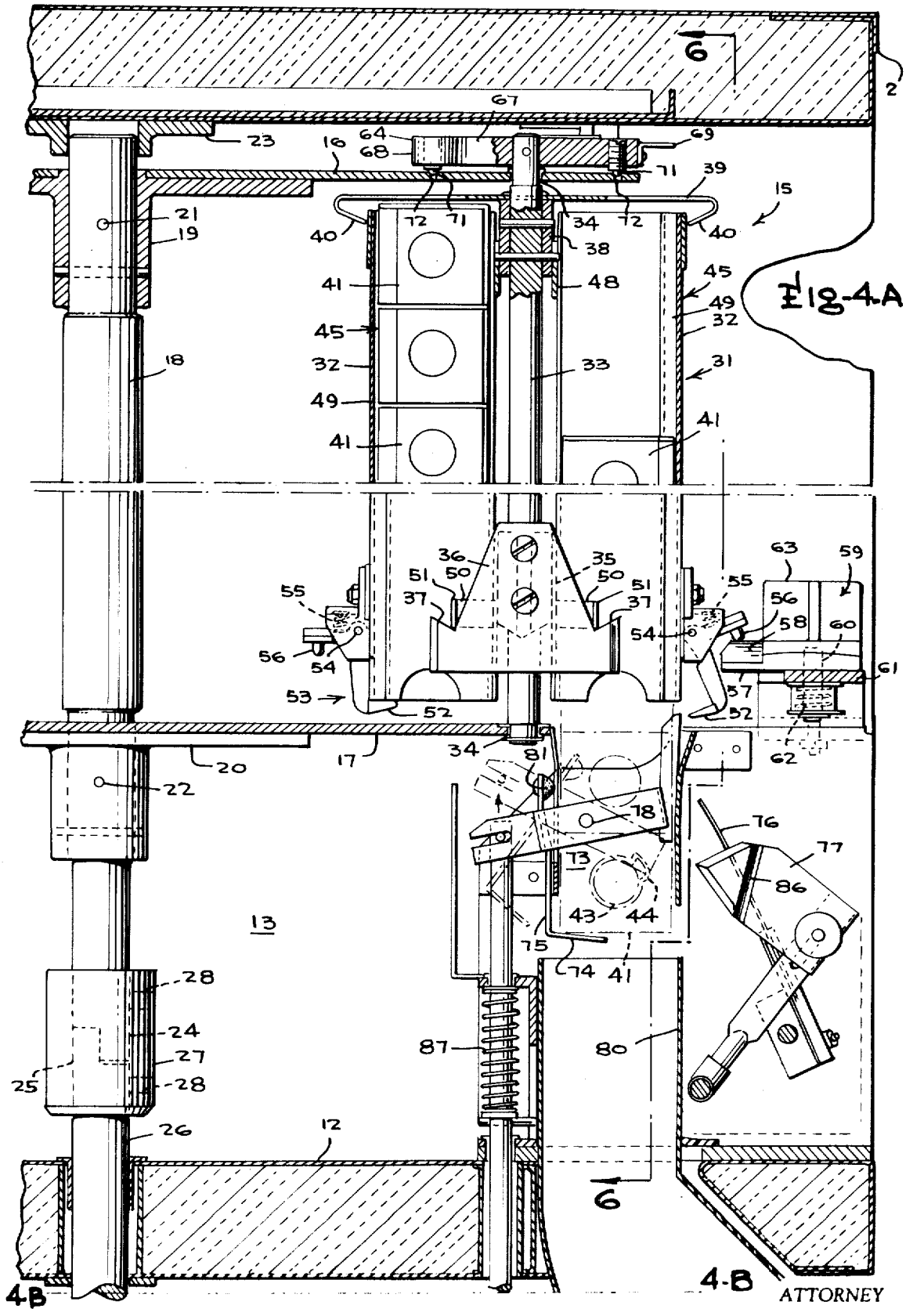

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Fig-4-A

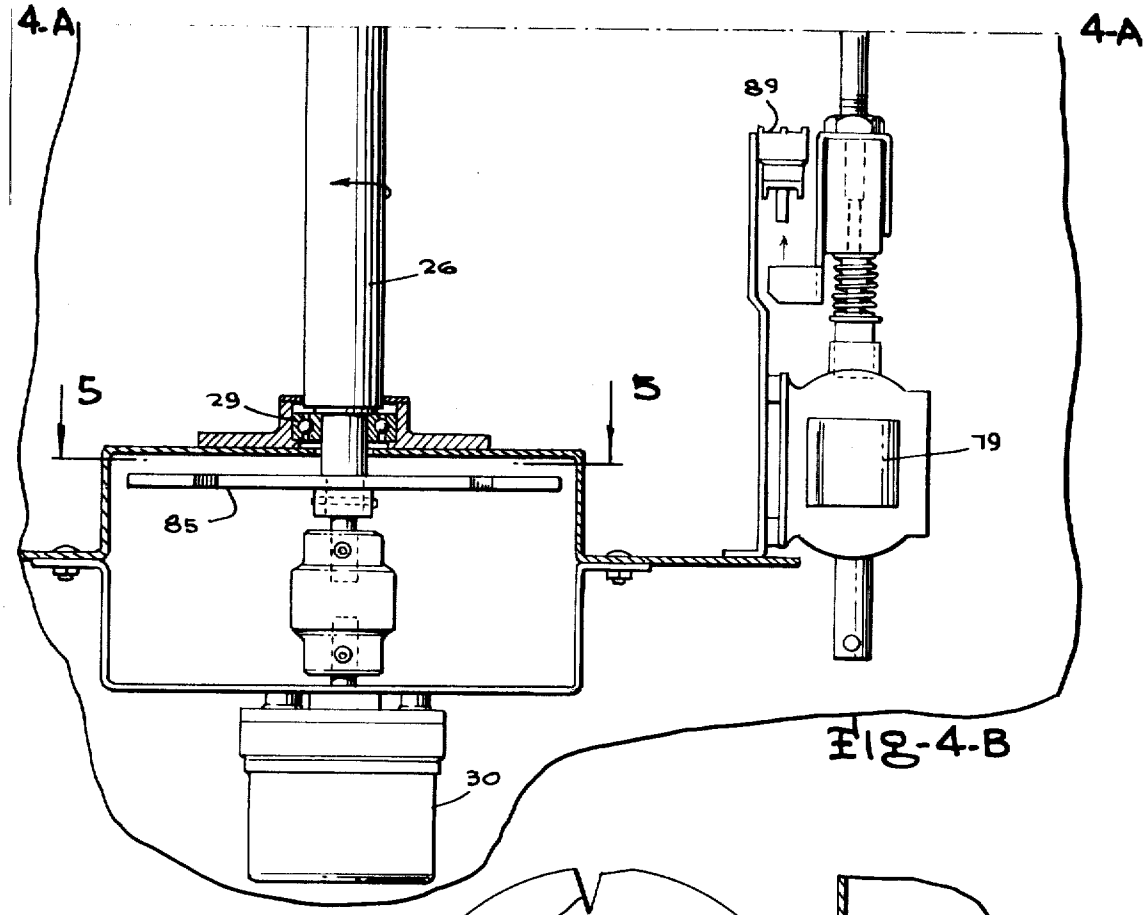
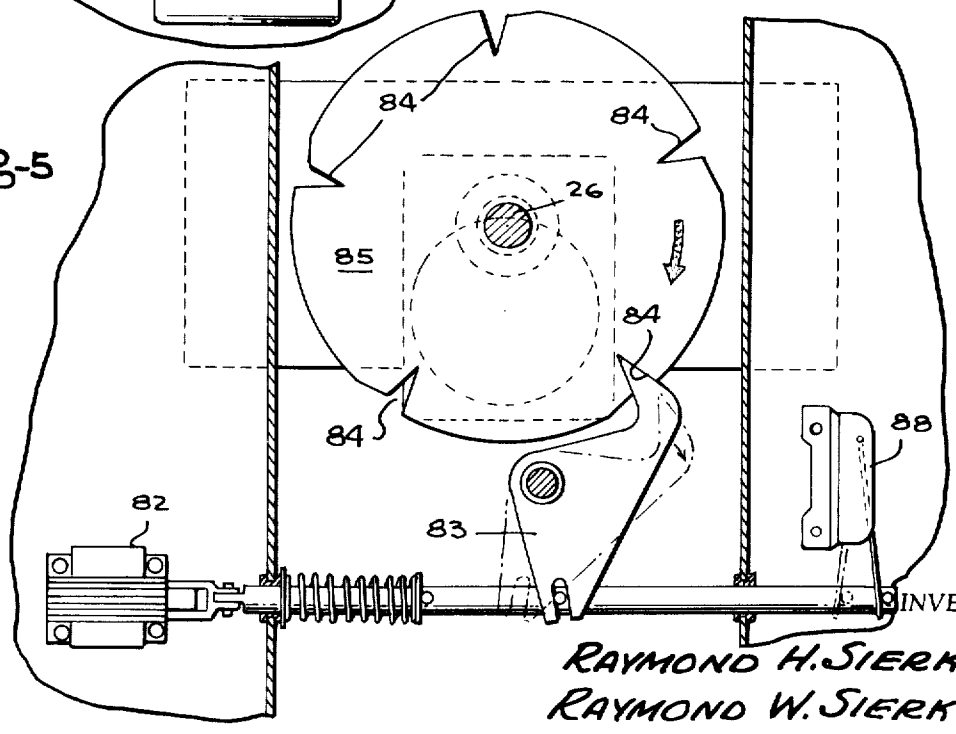


Fig-4-B

Fig-5



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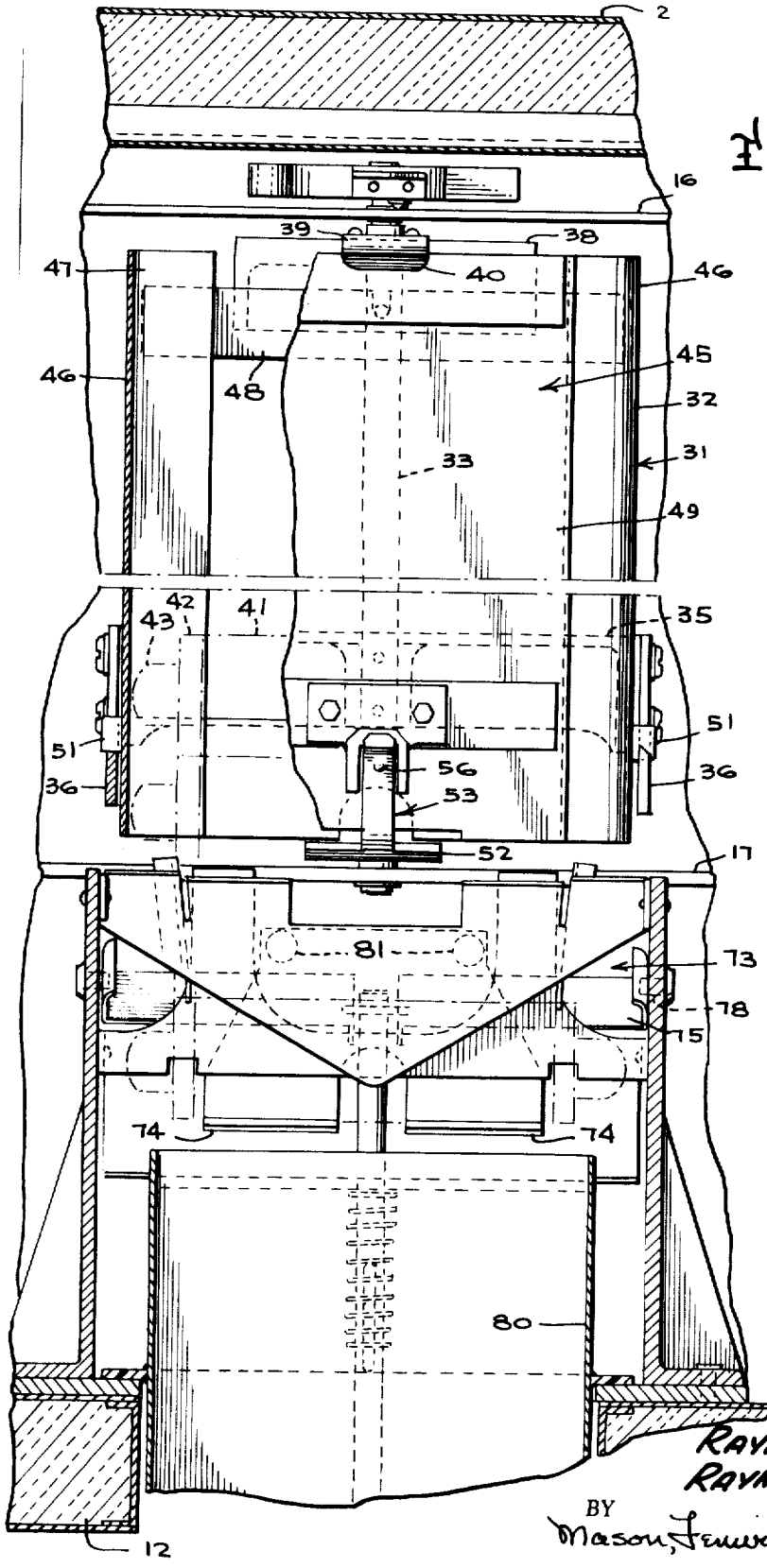


Fig-6

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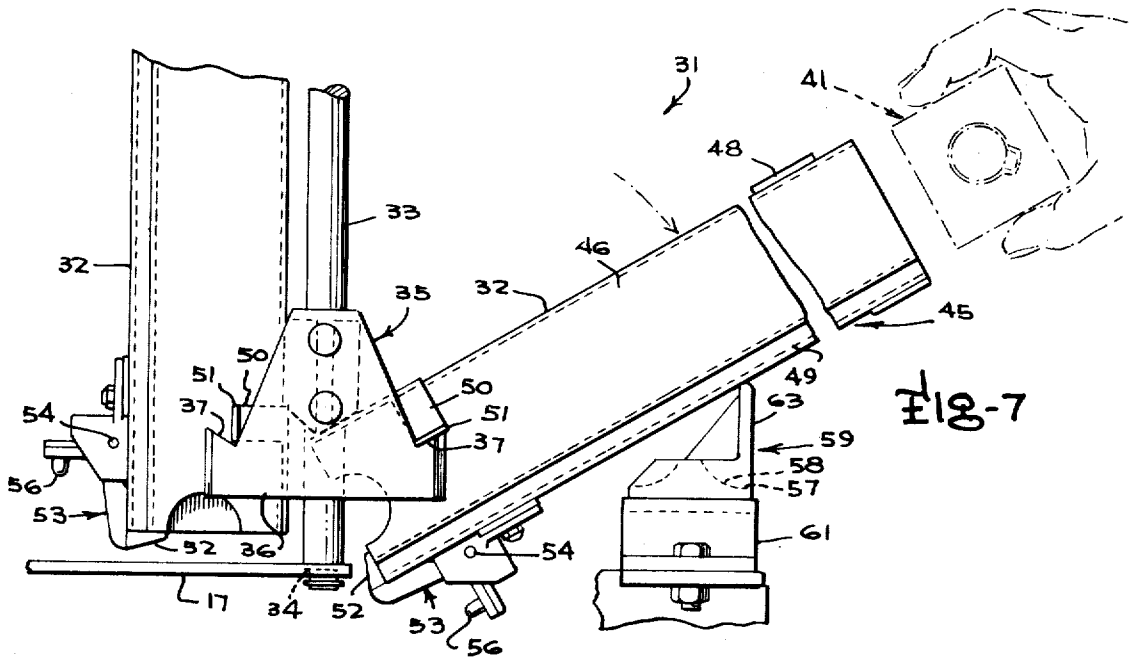
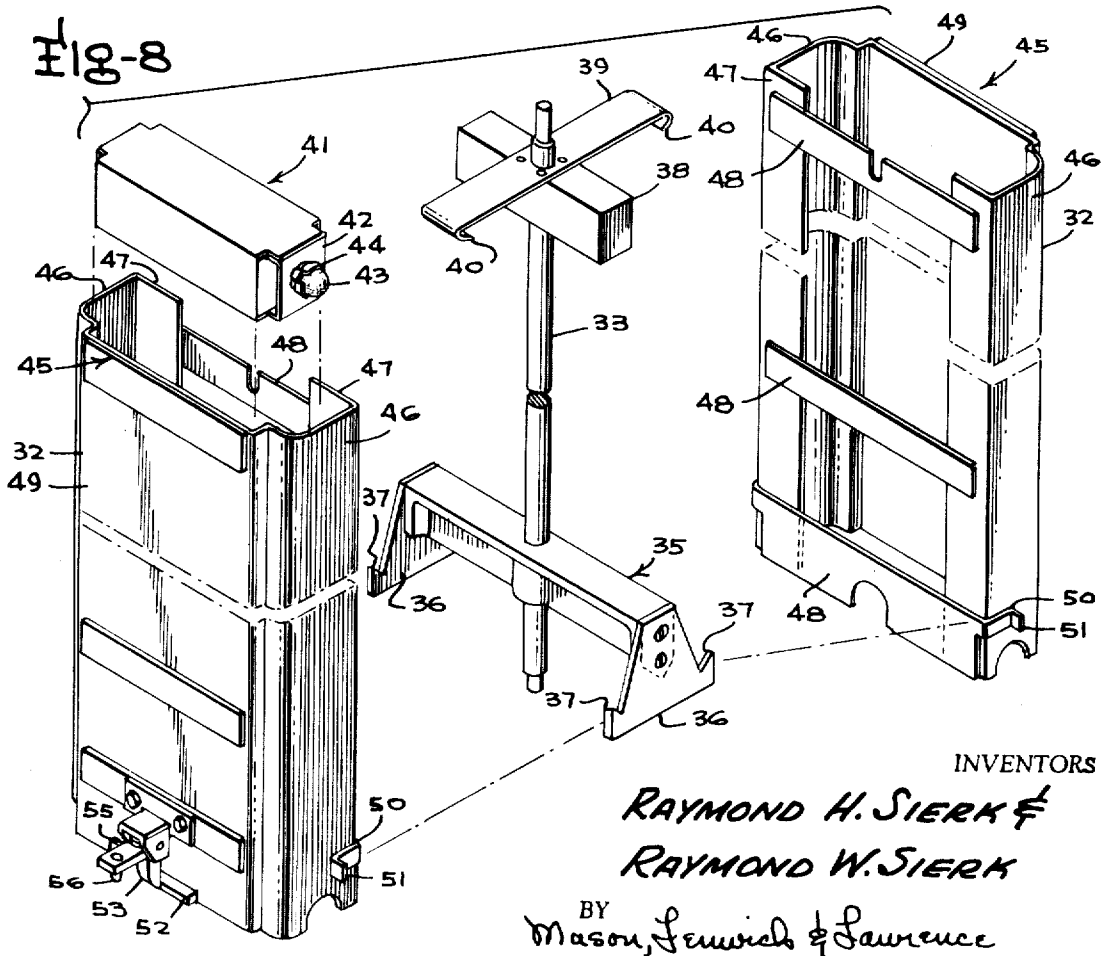


FIG-7

FIG-8



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MAGAZINE FOR DISPENSING MACHINE

BACKGROUND OF THE INVENTION

This invention relates to packaged article dispensing machines, and particularly to machines for automatically dispensing packaged sandwiches which are cooked at the time of dispensing. The present machine is an improvement over the machine disclosed in our prior U.S. Pat. No. 2,794,384 **issued June** 4, 1957, and the dispensed package is the one disclosed in that patent and in U.S. Pat. No. 2,959,339, issued Nov. 8, 1960. The mechanism for cooking the dispensed product is disclosed in detail in prior U.S. Pat. No. 3,537,387, issued Nov. 3, 1970.

The machine disclosed in U.S. Pat. No. 2,794,384 has facilities for storing and refrigerating a quantity of frankfurter sandwiches which are wrapped in napkins and enclosed in cartons of specific construction. The ends of the frankfurters project beyond the ends of the carton, and, when the package is to be dispensed, electrodes contact the projecting ends and heat the frankfurter by passing the current through the frankfurter. Means are provided for cutting off the projecting ends after cooking, and for releasing the package from the machine. U.S. Pat. No. 3,537,387 shows an improved means for contacting and cooking the frankfurter.

The original machine, as disclosed in U.S. Pat. No. 2,794,384, had a sandwich magazine which included a plurality of racks fixed about a rotatable turret. As one rack emptied, the turret rotated to bring a full rack to the cooking and dispensing position. While this arrangement is quite effective, and, in fact, forms the basic structure of the present invention, it did not hold a sufficient quantity of sandwiches to be operative more than a short period of time. When empty, the machine would be inoperative until a fresh supply of sandwiches could be loaded into the machine. Frequent servicing of the machine is not practical.

SUMMARY OF THE INVENTION

The general object of the present invention is to provide a magazine of the turret type having increased load capacity for a turret of given dimensions.

A more specific object of the invention is to provide a turret-type magazine having a plurality of package-holding racks, each of which has parallel package receptacles to double the storage space available.

A further object is the provision of a double rack magazine arrangement, wherein each double rack is automatically revolved after emptying of one rack to bring the companion rack into delivery position so that its contents will be available upon a second revolution of the magazine turret.

Another object is to provide means to allow the turret to make one full revolution in predetermined steps, and then a second revolution before being automatically stopped.

It is also an object of the invention to provide means to automatically release the contents of a rack for cooking and dispensing singly when the rack is positioned at the cooking and dispensing position.

Still a further object is to provide a turret which is removable as a whole from the refrigerating chamber of the machine, and racks which are easily removable from the turret and which can assume a tilted position to facilitate loading.

Yet another object of the invention is to provide means for releasing packages from the racks when at the dispensing position, which is rendered inoperative when the racks are to be tilted for receiving a new supply of sandwich cartons.

Other objects of the invention will become apparent from the following description of one practical embodiment thereof, when taken in conjunction with the drawings which accompany, and form part of, this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial side elevation of the dispensing machine of the present invention, the upper part of the casing being broken away to show the refrigerating chamber in vertical section and the improved package magazine in side elevation;

FIG. 2 is a front elevation of the machine;

FIG. 3 is a horizontal section, taken on the line 3—3 of FIG. 2, illustrating the magazine in top plan, parts being broken away;

FIGS. 4A and 4B, together, constitute an enlarged vertical section taken on the line 4—4 of FIG. 2;

FIG. 5 is a horizontal section taken on the line 5—5 of FIG. 4B, showing the turret rotation control means;

FIG. 6 is a vertical section taken on the line 6—6 of FIG. 4A;

FIG. 7 is a view similar to a portion of FIG. 4A, illustrating the lower portions of the magazine racks at the dispensing position, with one rack tilted for reloading; and

FIG. 8 is an exploded perspective view of the components of one of the magazine racks.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings in detail, only the turret magazine and associated parts will be described in detail. The above-mentioned prior patents may be referred to for other details of the machine.

The machine **1** is housed in a casing **2**, having inner and outer access doors **3** and **4** on one side. Signal lights, such as the cooking light **5**, machine empty light **6** and the coin indicating lights **7**, may be located appropriately on the outer door **4**. A dispensing outlet **8** with self-closing door is provided on the outer door **4**. Suitable coin slot **9**, coin return handle **10**, and return coin cup **11** are also on the outer door **4**.

The casing is divided by a horizontal partition **12** into an upper refrigerated compartment **13** and a lower electrical control compartment **14**. The turret-type sandwich magazine **15** and its cooperating mechanism, except for the rotating motor, are located within the refrigerated compartment **13**.

Turret **15** has a top disk **16** and a bottom disk **17** held in vertically spaced relation on a central shaft **18**. The disks have hub members **19** and **20**, fixed to their respective disks and secured by pins **21** and **22** to the shaft, so that the shaft and disks form a single rotatable unit. Shaft **18** projects upwardly beyond top disk **16** and is seated in a bearing **23** carried on the underside of the top of the casing. The lower end of the shaft extends below the bottom disk and hub and terminates in a stepped end **24** to seat upon the upper stepped end **25** on the drive shaft **26**. A coupling sleeve **27** slips over

the mating ends of the shafts and is held to the shafts by set screws 28. Coupling sleeve 27 is located in a "fail safe" position on shaft 18. Shaft 26 is mounted in a suitable thrust bearing 29, and is driven by a motor 30.

With the construction as described above, the turret can be removed as a whole from the refrigerated area when required. This is accomplished by loosening set screws 28 and allowing the coupling sleeve 27 to be lifted up on the shaft 18 so that the turret shaft is free to move transversely. As the turret tilts, its end can easily be removed from the upper bearing 23. This will allow the entire turret to be taken out through the access doors.

Arranged in a circular pattern concentric to shaft 18 and between the top and bottom disks is a plurality of magazine racks 31. Each magazine consists of two racks 32, carried by a shaft 33 having its ends journaled in bearings 34 in the top and bottom turret disks. The shafts are mounted for free rotation. As the magazines are identical, only one will be described.

Shaft 33 carries a lower bridge 35, which is non-rotatably fixed to the shaft. The bridge serves as a bottom separator for racks 32 and as a mounting means for rack-supporting plates 36 screwed to the bridge ends. Plates 36 may take any form, but each contains a pair of rack-seating notches 37, with the notches being equally spaced on opposite sides of the shaft 33. A second bridge 38 is located near the upper end of shaft 33, and serves as a separator for the racks 32, and, at the same time, as abutments for the upper ends of the racks when the racks are in upright position. Just above the upper bridge 38, there is a rack holding member, which consists of a strip of flexible material 39 at right angles to the bridge 38 and fixed to the bridge. The strip terminates at its outer ends in downturned catch fingers 40 to engage, and hold, the upper ends of the racks. This will releasably hold the racks against the upper bridge member 38.

Before proceeding with a description of the racks, the nature of the package to be dispensed should be understood. The package is disclosed in detail in U.S. Pat. No. 2,794,384 and also in U.S. Pat. No. 2,959,339.

The package consists of a rectangular carton 41 having reduced width extensions 42 at the ends. The extensions are open at the sides, to permit the entry of the frankfurter end-severing knives, and serve to support the projecting ends of the frankfurter 43. In the form shown, the projecting ends of the frankfurter are provided with ring-like contacts 44 against which the cooking electrodes will bear during the cooking cycle. For purposes of the present invention, no further details of the package are necessary.

The racks 32 are elongated members formed from sheets bent to provide a back 45, sides 46 and front flanges 47. Bracing strips 48 extend across the open front between the front flanges 47 to complete a generally rectangular shape receptacle. The back wall 45 is centrally recessed, as at 49, to provide a guide which is approximately the length of the main rectangular portion of the carton 41, to allow the sides of cartons to seat in the recess and be guided in a vertical direction as they move down the rack during dispensing operations.

The bottom brace member 48 of the rack has extensions 50 which extend along the sides of the rack and are outturned to provide mounting lugs 51 at each side of the rack near its base. The lugs 51 seat in the notches 37 in plates 36 to pivotally support the racks on the plates. In mounting the racks, the bases will be inserted through the access doors, and the mounting lugs 51 seated in the notches 37. The rack will then be swung upwardly into a vertical position into contact with the upper bridge 38 on shaft 33. As this occurs, the catch 40 at the end of the flexible strip 39 will cam over the back wall of the rack and drop down to engage and hold the rack against the upper bridge. The rack will then be in operative position.

Each rack has a releasable package-supporting shelf 52 at its lower edge. The shelf is carried by one arm of a bell crank 53 which is pivotally attached to the wall of the rack near its base, as at 54. A coil spring 55 normally forces the bell crank into position to hold the shelf 52 horizontally at the lower edge of the rack, projecting beneath packages stacked within the rack. The arm of the bell crank opposite that which carries the shaft has a cam follower 56 that is adapted to ride up over a cam 57 positioned at the dispensing station. As the turret rotates to bring a magazine rack to the dispensing station, cam follower 56 will ride up the incline 58 of the cam 57 and rock the bell crank 53 to withdraw the shelf from beneath the packages in the rack which has just arrived at the dispensing station. Cam 57 is carried upon a rotatable bracket 59. The bracket is pivoted at 60 to a suitable support 61 carried by the casing. A coil spring 62 may be mounted on the pivot 60 to frictionally hold the bracket 59 in positions of adjustment on its support. The cam bracket is rotatable from a position in which the cam is moved adjacent to the racks and in the path of movement of the cam followers 56, and to a position at right angles to its operative position wherein it is out of the path of the cam followers so that no tripping action will occur. Bracket 59 carries a vertical stop 63, and when the cam is rotated to its inoperative position the stop will be in the path of downward tilting movement of the rack and form a support for the rack during loading operations. This position of the cam bracket and rack is shown most clearly in FIG. 7. As the cam has been moved away from the rack, the shelf will be in package-supporting position when the rack is tilted for loading.

At the top of each shaft 33, there is a magazine rotating spider 64 that cooperates with a pair of cams 65 and 66, mounted on the underside of the casing top, to rotate the magazine during turret rotation to replace an empty rack of a magazine with a full one. The rotating spider is of swastika shape, having four radial arms 67 equally spaced about the shaft on which the spider is mounted, with each arm having a cam following toe 68 and the toes of all of the arms facing in the same circumferential direction. The spider is fixed upon shaft 33 so that two of the arms are parallel to the length of the racks, and the other two arms are at right angles to this direction.

With particular reference to FIG. 3, it will be seen that as the turret rotates to bring a fresh magazine to the dispensing position, the inner cam following toe 68 of the spider on the unit leaving the dispensing station will contact cam 65 and rotate the magazine through 90°. This will position the next succeeding cam following toe 68 so that it will contact cam 66 as the turret

continues its rotation. When the turret has finished its step of rotation, the magazine will not have completed its second quarter rotation, but this movement will be completed when the turret begins its next rotative step. This will have rotated the magazine through 180°, so that the now empty rack **32** faces inwardly of the turret and the full rack faces outwardly. This sequence is continued until all of the magazines have been reversed in position, and the turret then continues through another complete rotation so that packages will be dispensed from the second rack of each magazine.

In order to automatically control the operation, so that an empty light will be turned on when all of the racks have been emptied, one of the spiders will be provided with an outwardly projecting switch actuator **69**. This member serves to close a micro switch **70** when the turret is rotated to move the last emptied rack from the dispensing position. Micro switch **70** is also mounted on the underside of the casing top.

In order to assure proper positioning of the racks of the magazines, to provide for proper functioning, each spider **64** carries a spring-pressed ball **71** on the underside of one arm for selective seating in openings **72** in the top disk **16** of the turret. The openings **72** are located at diametrically opposite points with respect to the axis of shaft **33**, so that the spider, and the magazine, will be releasably held in positions of rotation spaced 180° from one another. This assures proper location of the racks for releasing the package-supporting shelves as the racks reach the dispensing station, and also proper alignment with the dispensing station.

In operation, and first in filling the several racks of the magazines of the turret, the access doors **3** and **4** will be opened, and cam **57** will be rotated 90° from its operative position as shown in FIG. 4A to its inoperative position as shown in FIG. 7. This moves the cam from the path of movement of the cam followers **56** carried by the bell cranks **53** which move the package-supporting shelves **52** to and from operative position. Therefore, the bell cranks, under the influence of their coil springs **55**, will rotate to place the shelves **52** beneath the lower ends of the racks in package-supporting position. At the same time, the stop **63** will be rotated into proper position to provide a support for the racks when they are at the loading position and tilted downwardly for loading.

As each magazine is brought to the loading position, the rack facing the access door will be released by lifting the catch **40** of the flexible strip **39** upwardly to release the top edge of the rack. The rack can then be swung downwardly with the mounting lugs **51** rocking in the notches **37** of the plates **36**. This will bring the racks to an inclined position resting upon the stop **63**, as shown in FIG. 7. Packages may then be inserted in the top to slide down the rack until the bottom package is in contact with the shelf **52**. The shape of the rack wall will act as a guide to properly align the packages within the rack. When the rack is full, it is tilted upwardly and the catch **40** will automatically snap over the upper edge of the rack wall and lock the rack in its operative position. The magazine will then be rotated to bring the other rack to the front, and loading of that rack will take place in the same manner as described. When both racks are filled, the turret is moved to bring the next magazine in position and the operation is repeated. This will continue until all of the racks of all of the magazines are filled.

Insofar as all of the magazines except one are concerned, it makes no difference which of the two racks is facing outwardly of the turret after loading. Of course, each of the magazines will be positioned so that the spring-pressed balls **71** will be seated in the openings **72**, which will ensure one rack being at the proper position for dispensing when the turret rotates to bring that rack to the dispensing station. It is essential, however, that the magazine having the spider with the switch actuator **69** be located at the dispensing station after the magazines are all ready and the machine is to be put into operation. It is also essential that the particular magazine be oriented so that the arm of the spider carrying the switch actuator **69** be radial to the turret with the actuator projecting beyond the edge of the upper disk. This is necessary to permit a second rotation of the turret and emptying of all of the racks prior to the contact of the actuator **69** with the micro switch **70** to turn on the machine empty sign. With the turret and magazines in the described position, the cam **57** is rotated back to its operative position, as shown in FIG. 4A, which will lift the cam follower of the rack at the dispensing position, moving the shelf **52** from beneath the packages and allowing the packages to drop into the cooking chamber **73**. Downward movement of the packages is stopped by the inturned lip **74** of a package-holding bracket **75**. The machine is now ready for operation.

When a coin, or the proper coins, are deposited in the coin slot **9**, the cooking electrodes **76** will be moved into contact with the metal contacts **44** on the ends of the frankfurter, as described in the above mentioned patents, and the frankfurter will be cooked. When the cooking is completed, cooking electrodes **76** will be withdrawn and knives **77** will move into the extensions **42** at the ends of the carton and sever the frankfurter ends so that none of the cooked frankfurter will project beyond the carton ends. Severed frankfurter ends are propelled outwardly into replaceable containers by movement of ribs **86** on knives **77** through the frankfurter. This also removes the portions carrying the contacts **44** and the underlying areas of the frankfurter which may be discolored by the cooking process. After knives **77** move back to their inoperative positions, the package-holding bracket **75** will be rocked about its pivot **78** through energization of solenoid **79** to remove the lip **74** from beneath the cooked package to allow that package to drop out through the dispensing chute **80** for removal through the dispensing outlet **8**. Bracket **75** carries a friction type package-contact member **81**, on the opposite side of the pivot **78** from lip **74**, which moves into pressure contact with the package above the one having the just cooked frankfurter, to hold that package against downward movement during the dispensing of the bottom package. After the package has dropped out, the solenoid is deenergized and the bracket is returned to its original position by action of spring **87**. Lip **74** is then under the bottom of the cooking chamber **13** to support the next package as it drops into position.

The above operation is continued until all of the packages in the rack have been dispensed. As the last package in the rack is dropped out, the bracket **75** is

free to move an excess amount because there is no package above the one being dispensed, and this excess travel operates the switch **89**, FIG. **4** B, which causes the turret to rotate one step of movement. This is done by energizing a solenoid **82** (see FIG. **5**) which withdraws a locking dog **83** from a notch **84** in a position controlling disk **85** at the lower end of the drive shaft **26**. At the same time, motor **30** is energized through switch **88**, FIG. **5**, to rotate the turret. Locking dog **83** will drop into the next notch **84** and open switch **88**, to stop the turret rotation with the next magazine in position for its outer rack to be over the entrance to the cooking chamber. During this movement of the turret, the spider **64** of the magazine having the empty rack will contact the cams **65** and **66** and rotate the magazine to move the full rack toward the outside, as previously described. It will be remembered that this movement is not completed on the first step of turret movement, but is completed as the second step begins. It will be seen that this rotation of the magazine moves the switch actuator **69** on the first spider to the rear so that it will not contact micro switch **70** as the turret continues its first revolution.

The step by step movement of the turret is continued for one revolution, during which time each of the magazines will have emptied one rack and been reversed to place the second rack in condition for emptying. The cycle of operation is again repeated, so that the second set of racks is brought to the dispensing position and all of the racks can be emptied. At the beginning of the second cycle of rotation of the turret, the magazine with the spider having the actuating member **69** will move from the dispensing position to the next adjacent position. During this movement the magazine will again rotate, so that the actuator is once more brought to the outside. As the last rack is emptied, and the last step of rotation of the turret is begun, the actuator **69** will strike micro switch **70** and cause the circuit to illuminate the "machine empty" signal light and deenergize the vending circuits to prevent acceptance of coins. The machine will then be ready for reloading prior to the next dispensing operation. When the machine is loaded, the magazine having the spider with the actuator is placed at the dispensing position with the actuating member facing outwardly. This position is always set up at the beginning of each operating phase.

With the above described turret arrangement the machine can carry an unusually large supply of packages to be dispensed, with the turret making two complete revolutions before the magazines are empty. This greatly lengthens the period of operation of the machine, and cuts down on the number of servicing operations which are necessary to keep the machine in operation.

While in the above one practical embodiment of the invention has been disclosed, it will be apparent that the particular details of construction shown and described are merely by way of illustration, and the invention may take other forms within the scope of the appended claims.

We claim:

1. A magazine turret for use in a package dispensing machine comprising a shaft and spaced end plates on the shaft, means to rotate the shaft step by step, magazine rotatably mounted in the turret between the end plates at spaced arcuate distances about the turret equal to the arcs of step by step movement of the turret, each magazine having multiple package-holding racks with one rack of each magazine being at a dispensing position, means to rotate the magazines sequentially, one magazine each step of rotative movement of the turret to move the rack of the magazine being rotated from the dispensing position and replace it with another rack of the magazine being rotated, whereby different racks of the magazines will be positioned for dispensing on sequential revolutions of the turret.

2. A magazine turret as claimed in claim **1** wherein, the number of multiple racks of each magazine is two, and the racks of each magazine are arranged in back to back relation.

3. A magazine turret as claimed in claim **2** wherein, each rack is tiltable from an operable position parallel to the other rack of the magazine to a loading position at an angle thereto, and there are means to releasably hold the racks in operable position.

4. A magazine turret as claimed in claim **3** wherein, the magazines have pivot seats for the racks and the racks have pivot means engageable in the seats, whereby the racks may be removed from the magazines when the holding means are released.

5. A magazine turret as claimed in claim **2** wherein, each magazine has a shaft intermediate the racks, the shaft being pivotably mounted in the end plates, and the means to rotate the magazines includes a cam follower mounted on each magazine shaft and a fixed cam in the path of movement of the cam followers as the turret rotates.

6. A magazine turret as claimed in claim **5** wherein, the cam followers are spiders having a plurality of arms each constituting a cam follower for cooperation with the fixed cam to provide for a plurality of stepped movements of the spiders and magazines.

7. A magazine turret as claimed in claim **6** wherein, there is a package-supporting shelf movably positioned beneath each rack, means including a cam follower on each rack to hold the shelf beneath the rack and move it therefrom, and a fixed cam at one rotative position of the turret to contact and operate the shelf-moving cam follower to move the shelf from beneath the rack.

8. A magazine turret as claimed in claim **7** wherein, the shelf-moving cam is pivotally mounted and the cam is rotatable to positions in the path of movement of the shelf-moving can follower and out of that path.

9. A magazine turret as claimed in claim **8** wherein, there is a machine empty light and a switch to control the light mounted adjacent the turret, and a switch actuator on one of the arms of one magazine spider operable to close the switch when the spider is in a selected position of step by step rotation.

10. A magazine turret as claimed in claim **9** wherein, the magazines have pivot seats for the racks and the racks have pivot means releasably engageable in the seats to allow each rack to assume a position parallel to the other rack of the magazine and a loading position at an angle thereto.

11. A magazine turret as claimed in claim **10** wherein, there are means to releasably hold the racks in operative position.

12. A magazine turret as claimed in claim 11 wherein, the shelf-moving cam has a rack support positionable to support the racks in inclined position when the cam is rotated out of the path of movement of the shelf-moving cam followers.

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