United States Patent

[11] 3,593,882

[72] Inventor **Walter H. Rhindress**
64 N. Harbor Drive, Ocean Ridge, Fla. 33444

[21] Appl. No. **827,204**
[22] Filed **May 23, 1969**
[45] Patented **July 20, 1971**

[54] **FOOD ARTICLE DISPENSER HAVING SPRING BIASED COVER FOR SINGLE-ARTICLE DISPENSING**
4 Claims, 8 Drawing Figs.

[52] **U.S. Cl.** ..... **221/150 A,** 221/113, 221/265
[51] **Int. Cl.** **A24f 27/14**
[50] **Field of Search** 221/13, 113, 150, 265; 99/326

[56] **References Cited**

UNITED STATES PATENTS

1,184,074	5/1916	Clark	221/265 X
1,425,531	8/1922	Mabey	221/150 (A) UX
1,490,365	4/1924	Du Grenier	221/265
1,884,365	10/1932	Suppiger et al.	221/265 X
2,777,604	1/1957	Welch	221/113
2,825,488	3/1958	Nelson	221/150 X
3,018,020	1/1962	Lancaster	221/113 X
3,213,264	10/1965	Pritz	221/113 X
3,298,569	1/1967	Weitzman	221/265 X
3,343,715	9/1967	Edwards	221/13

Primary Examiner—Joseph R. LeClair
Assistant Examiner—Steven E. Lipman
Attorneys—Clarence A. O'Brien and Harvey B. Jacobson

ABSTRACT: A food dispenser including a circular distributor having radial vanes for storing food articles. The distributor is rotatably fixed to a shaft which is caused to rotate in fixed increments by a solenoid controlled pawl and ratchet assembly. A chute is disposed underneath the distributor so that a single food article positioned between adjacent radial vanes is dispensed to the chute when the article is disposed above the chute opening. A chute cover is freely mounted to the shaft and insures that only one food article is dispensed at a time. A heating assembly is located beneath the distributor which heats the articles in the dispenser.

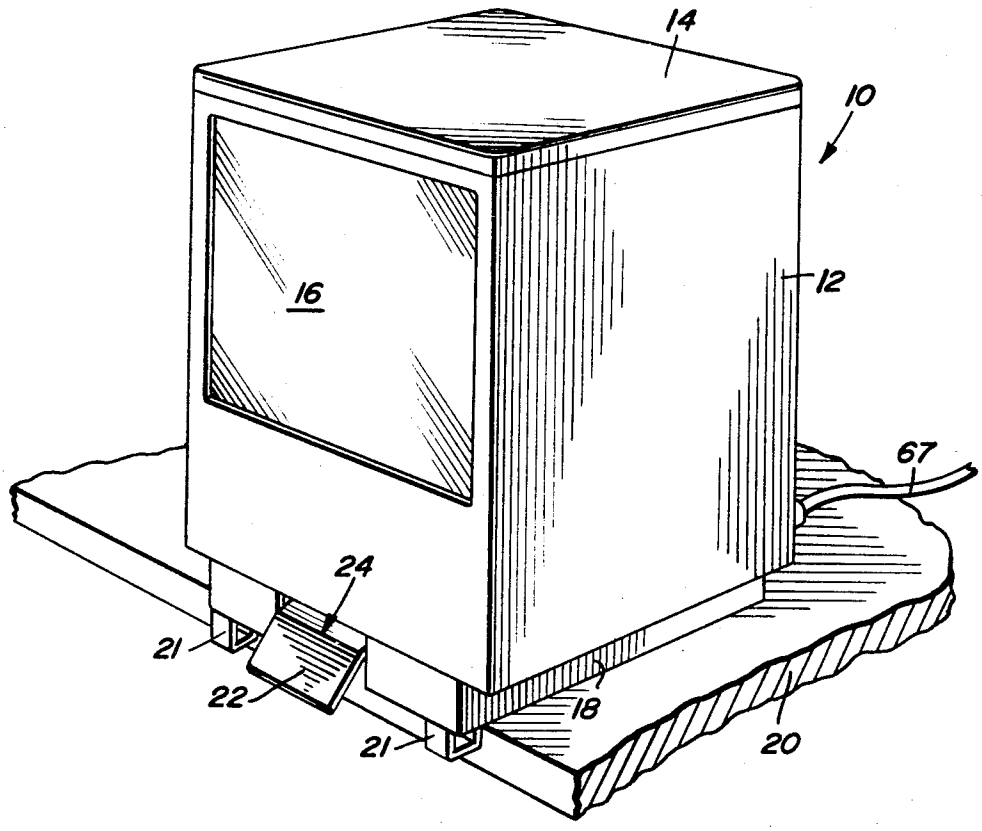


Fig. 1

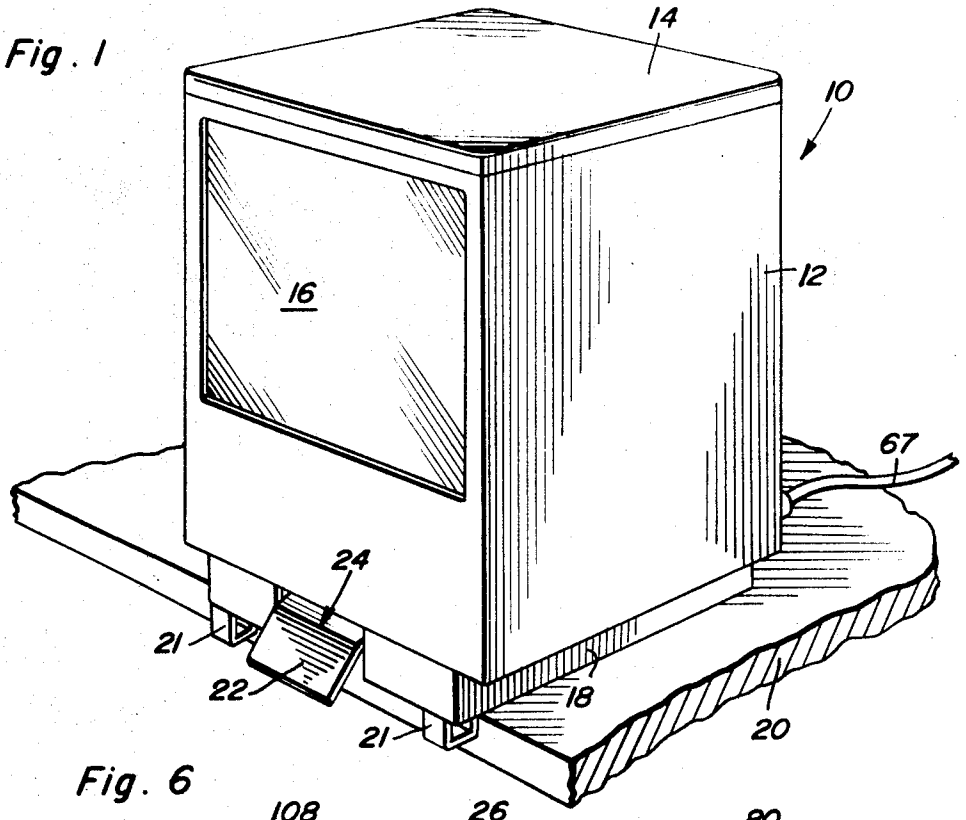


Fig. 6

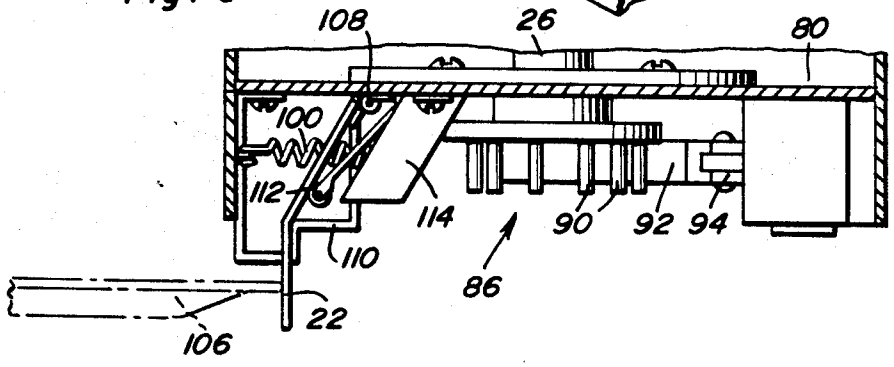
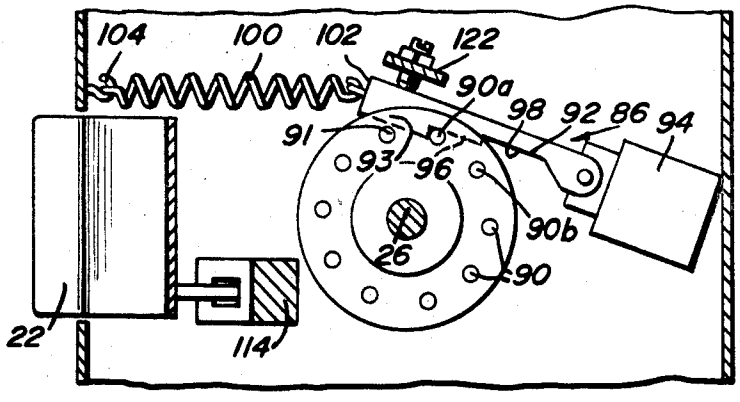


Fig. 7



Walter H. Rhindress
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Fig. 2

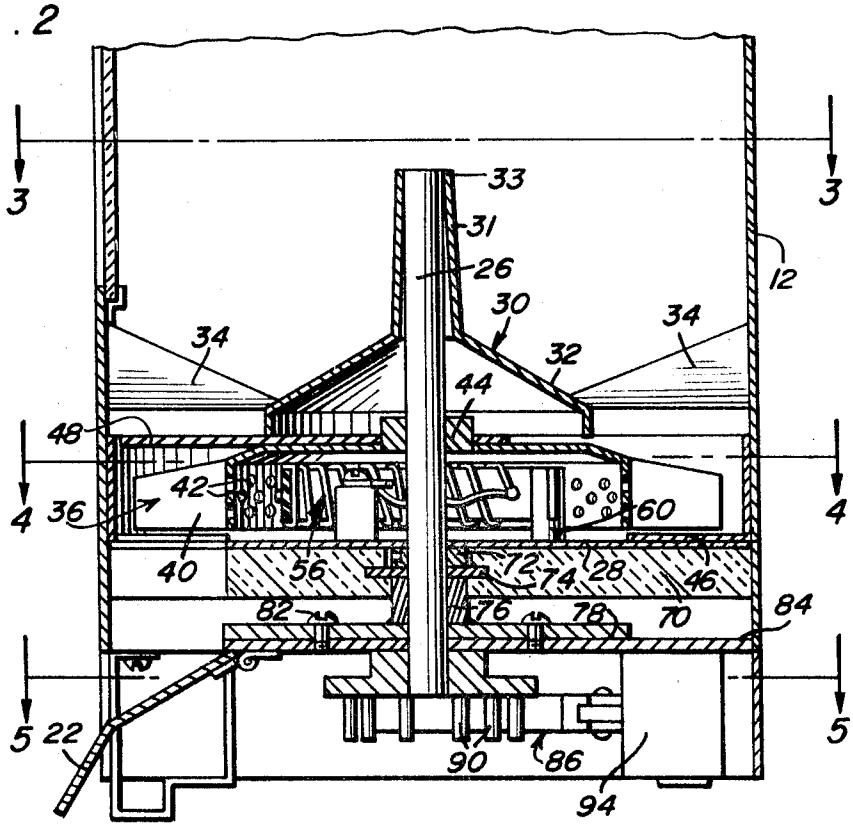


Fig. 3

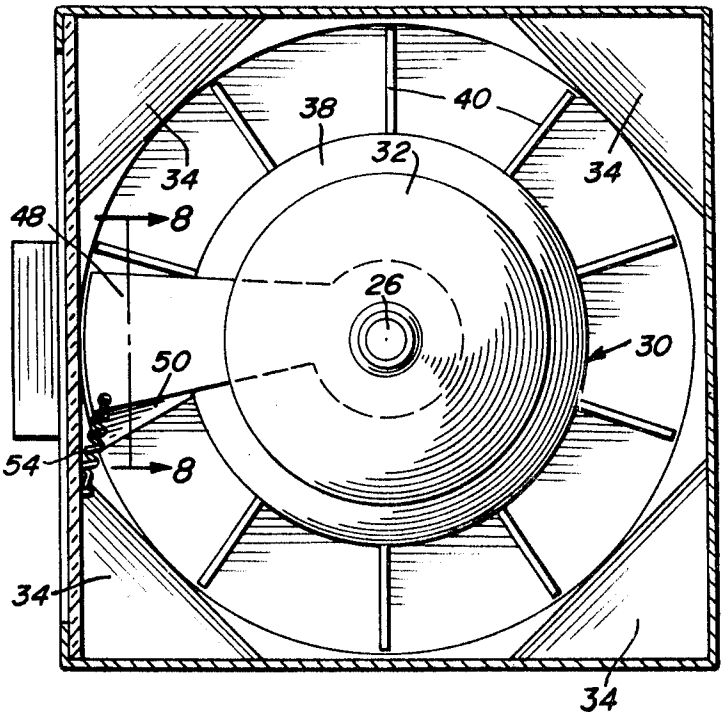
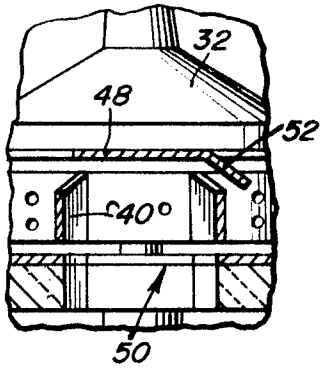


Fig. 8



Walter H. Rhindress
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Fig . 4

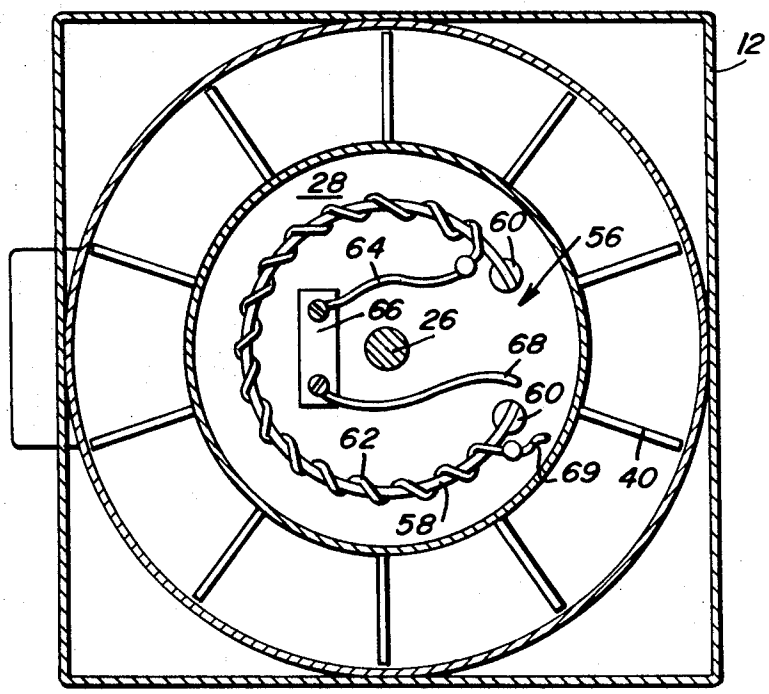
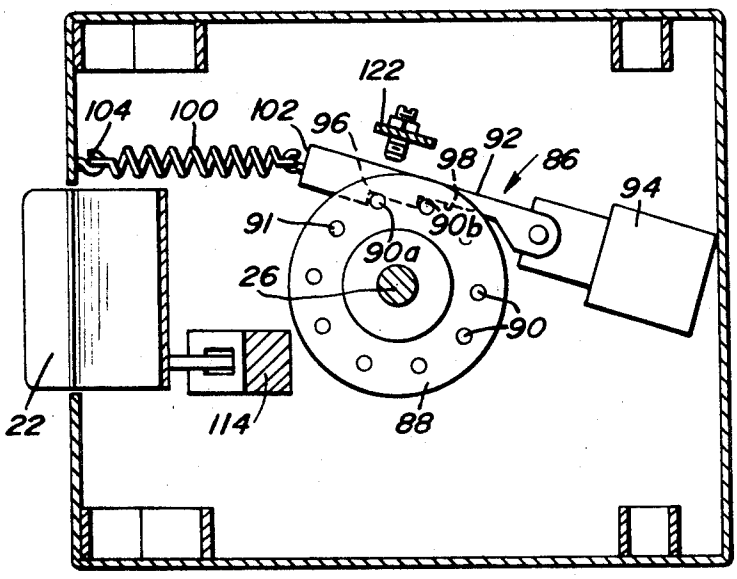


Fig . 5



Walter H. Rhindress
INVENTOR

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

FOOD ARTICLE DISPENSER HAVING SPRING BIASED COVER FOR SINGLE-ARTICLE DISPENSING

The present invention relates to food article dispensers.

It is common in restaurants and other places, where food is served, to dispense food articles such as rolls by hand. In certain establishments, rolls are manually taken from a heater bin before serving. When they are required for serving, they are removed by hand to a serving plate. Such an operation causes rapid drying out of the rolls due to the elevated temperatures to which the rolls are subjected. Also, the procedure is unsanitary inasmuch as the food product is touched by the server's hands.

The present invention includes an automatic dispensing device for articles and in particular food articles. The dispenser is designed to automatically dispense a single article whenever a trigger switch is contacted by a serving plate. The dispenser plate is disposed below the chute so that after the trigger switch is actuated, a single food article, such as a roll, is deposited on the plate. Heater means are provided in the dispenser so that the food articles can be kept warm. However, the dispenser is constructed so that it is relatively airtight thereby retarding the drying process which makes rolls and similar food products stale. Additional benefits by use of the present invention reside in the sanitary nature of the device inasmuch as it dispenses food articles without the necessity of having a server touch them by hand. Further, it is a time saver inasmuch as it takes only one hand to operate the dispenser.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a perspective view of the external appearance of the present invention.

FIG. 2 is a longitudinal sectional view illustrating the interior components of the present invention.

FIG. 3 is a transverse sectional view taken along a plane passing through section line 3–3 of FIG. 2.

FIG. 4 is a transverse sectional view taken along a plane passing through section line 4–4 of FIG. 2.

FIG. 5 is a transverse sectional view taken along a plane passing through section line 5–5 of FIG. 2.

FIG. 6 is a partial sectional view illustrating the motion imparting mechanism of the present invention.

FIG. 7 is an illustration of a pawl and ratchet assembly for effecting shaft rotation.

FIG. 8 is a partial sectional view taken along a plane passing through section line 8–8 of FIG. 3 illustrating the relation between the chute of the dispenser, the distributor means and the chute cover.

Referring to the drawings and more particularly FIG. 1 thereof, the present article dispenser is generally indicated by reference numeral 10 and is seen to include a housing 12 having a removable cover 14 to permit the loading of the dispenser. If desired, a glass pane 16 may be mounted in the front wall of the housing to permit the viewing of the articles in the dispenser. Although the preferred embodiment of the present invention is explained in terms of a food article dispenser for handling rolls or the like, it will be appreciated that the mechanism of the dispenser may be employed to dispense other articles including those usually dispensed by vending machines.

The base 18 of the housing rests upon a supporting surface such as a counter 20. Protruding legs 21 extend downwardly from the base and are adapted to engage the front edge of the supporting surface 20 to prevent rearward sliding of the dispenser when a plate is pressed against switch trigger 22 caUsing an article to be dispensed onto the plate from the dispenser chute exit 24.

Referring to FIG. 2, the internal mechanism of the present invention is seen to include a centrally disposed vertically

oriented shaft 26. A horizontally disposed base plate 28 is connected to the walls of the housing 12 and serves as a boundary between the food handling mechanism above the base plate and the motion imparting mechanism disposed beneath the plate.

The food handling components include a roll or food article Distributor characterized as a hollow frustoconical member 30 constructed from a first tubular section 31 capping the upper portion of shaft 26, and a lower inverted conical section 32. The upper end of spreading tubular section 31 engages the vanes end 33 of shaft 26 rendering vertical support to the frustoconical member 30. Deflection plates 34, also seen in FIG. 3, guide the rolls away from the housing corners into the central housing portion. Distributor means are fixed to the shaft 26 below the frustoconical member 30. The distributor means is generally indicated by reference numeral 36 and as shown in FIG. 3, it includes a downwardly spreading frustoconical section 38 having radial vanes or arms 40 extending therefrom. The frustoconical portion of the distributor means includes apertures 42 therein to permit heat flow therethrough as hereinafter explained. The upper central portion of the distributor means 36 includes a boss or collar fastener 44 allowing the distributor means to be fastened to the rotatable shaft 26. An annular plate 46 is supported atop base plate 28 and forms a surface upon which the rolls in the distributor means slide, when the distributor means is rotated.

In order to understand the operation of the present invention, reference is made to FIG. 3 which illustrates a top plan view of the distributor means. When the dispenser housing is filled with rolls, the frustoconical member 30 guides or feeds rolls into the chambers formed by adjacently positioned radial vanes or arms 40. Thus, in actual operation of the device, each of the chambers defined by the radial vanes will contain a single roll. A mechanism examined hereinafter, caUses incremental motion of shaft 26 which in turn translates this motion to the radial vanes resulting in sequential movement of adjacent rolls over a chute formed in the interior of the housing. Thus, each time a roll is disposed above chute 50 it is caused to be dispensed to the user.

Referring to FIGS. 2, 3 and 8, in order is prevent more than one roll from passing through the chamber overlying chute 50, a chute cover 48 having the shape of a keyhole is freely mounted to the shaft 26 at a point immediately below the frustoconical member 30. The lateral edges of the cover are indicated by 52 to be downwardly turned so that as the distributor 36 rotates, any rolls riding atop the rolls in already the distributor chambers are caused to move over the chute cover as it approaches chute 50. As will be seen in FIG. 3, the radially outward end portion of the chute cover is connected by means of a spring 54 to an adjacently positioned deflector 34. The spring connection causes the chute cover to be biased in a chute covering position with the ability to yield when engaged by a riding roll atop the distributor. By yielding to the roll, the chute cover causes no damage to the riding roll. As the distributor is rotated, the riding roll is caused to slide over the chute cover due to the downturned edges 52 mentioned hereinbefore. Thus, by utilizing the present chute cover, the dispensing of a single roll at a time is insured. Thus, the chute cover is designed so as not to injure or damage stored rolls which engage the cover.

Referring to FIGS. 2 and 4, a heater assembly 56 is seen to be around the shaft 26 and between the frustoconical member 30 and the base plate 28. The heater assembly includes an arcuate insulator ring 58 being contoured in a horseshoe shape. The outward ends of the insulator are anchored within mounting trips 60. A heater element 62 is wound around the insulator. One end of the heater element is connected to the first terminal of a thermostat by means of connecting wire 64. The thermostat is indicated by reference numeral 66. The second terminal of the of the thermostat is connected to the first lead of an input power line 67, (FIG. 1) by a connecting lead 68. The opposite end of the heater element is connected to the second lead of the power line by a connecting lead 69. The

purpose of the thermostat is to control the temperature in the dispenser housing. Of course, either connector lead **64** or **69** may be serially connected to a switch which controls energization of the heater element **62**.

In order to insulate the generated heat from the lower shaft rotating mechanism, an insulating layer **70** is concentrically disposed around the shaft **26**. However, a portion of the insulating layer **70** is cut away to form the aforementioned chute **50** shown in FIG. **8**.

The shaft is supported at an intermediate portion thereof by a set collar **72** fixed to the shaft at a point immediately beneath the base plate **28**. A fiber washer **74** is embedded within the insulating layer **70** and acts as a bearing for the set collar **72**. A bushing **76** is disposed around the shaft **26** immediately beneath the fiber washer **74**. The latter mentioned bushing includes an annular flange **78** riveted to the lower edge of the bushing **76** and secured to a housing mounting plate **80** by means of suitable fasteners **82**. The mounting plate **80** is affixed to the walls of the housing by welding **84** or the like.

The means for moving shaft **26** in incremental steps is particularly illustrated in FIG. **6** and indicated by reference numeral **86**. A second view of the same mechanism is shown in FIG.. **5** wherein there will be seen a cylindrical member **88** mounted to the shaft **26**. The cylindrical member includes a number of circumferentially spaced pegs or teeth **90** extending vertically downwardly from the underside of the cylindrical member. The member and the attached teeth serve as a ratchet. An elongated arm **92** is pivotally connected to the plunger of an electrical solenoid **94**. The arm **92** is generally disposed tangentially to the circle generated by the teeth **90**.

In the steady state condition, shown in FIG. **5**, a first notch **96** in the free end portion of the arm engages one of the teeth **90***a*. An intermediately disposed notch **98** engages an adjacent tooth **90***b*. In FIG. **6** there will be shown a plate or dish **106** pressed against trigger **22** disposed below the exit chute **24** of the dispenser, as shown in FIG. **1**. The trigger is pivotally mounted at an opposite end thereof to mounting plate **80** by means of a hinge **108**. A bracket **110** serves as a mechanical stop to limit the inward displacement of the trigger **22**. When the trigger is pushed up against the stop, the actuator **112** of microswitch **114** is depressed thereby closing the switch for causing energization of the solenoid **94**. This results in the arm moving inwardly of the solenoid **94** which causes cylindrical member **88** to move clockwise, as shown, until an approaching tooth **91** cams against the edge **93** of the arm. This camming action continues until the arm pivots to a position wherein further motion is arrested by mechanical stop **122**. FIG. **7** illustrates this set condition wherein tooth **90***b* is disengaged, tooth **90***a* is engaged by recess **96**, and tooth **91** bears against edge **93**. After a product has been dispensed on the plate **106**, the plate is removed from the trigger **22** thereby disengaging the solenoid.

A coil spring **100** is connected at opposite ends thereof between the outward end **102** of arm **92** and the housing at point **104**. Upon solenoid deenergization, the spring forces the arm edge **93** to ride over tooth **91** until the tooth becomes engaged in recess **96** which reestablishes the initial condition shown in FIG. **5**. The relation of the arm **92** and the cylinder **88** may be fairly characterized as pawl and ratchet action.

Each time the shaft is rotated to the next incremental position, the dispenser distributor **36** is rotated to a location wherein the center of an adjacent chamber defined by the radial vanes **40** is disposed above the chute **50**. Therefore, each time trigger **22** is depressed another roll will be dispensed.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What I claim as new is as follows:

1. An article dispenser enclosed in a housing having a dispensing chute, the dispenser comprising a shaft, rotatable distributor means fixed to the shaft for loading articles therein and delivering the articles to the chute entrance, a cover mounted on the shaft above the distributor means, the cover being yieldably biased to shield the chute so that only one article can be dispensed at a time when the distributor means assumes an unloading position over the chute, means responsive to triggering action for rotating the shaft in fixed increments permitting dispensing of an article by the distributor means at each increment of shaft rotation, switch means for effecting the triggering action, and heater means mounted under the distributor means for permitting heat to rise therethrough and causing the heating of articles disposed in the housing.

2. The device set forth in claim **1** wherein the distributor means includes apertures formed therein for permitting heat flow from the heater means through the distributor means to the stored articles.

3. An article dispenser enclosed in a housing having a dispensing chute, dispenser comprising a shaft, rotatable distributor means fixed to the shaft for loading articles therein and delivering the articles to the chute entrance, a cover mounted on the shaft above the distributor means shielding the chute entrance for preventing more than one article from being delivered to the chute entrance at a time, the cover having means for deflecting articles over the cover, and biasing means connected to the cover for maintaining the cover in the shielding position, the biasing means permitting the cover to yield in response to contacting articles until the deflecting means complete deflection of the articles over the cover at which time the cover returns to the shielding position.

4. The structure set forth in claim **3** wherein the deflecting means comprises at least one flange angularly offset from an edge of the cover.