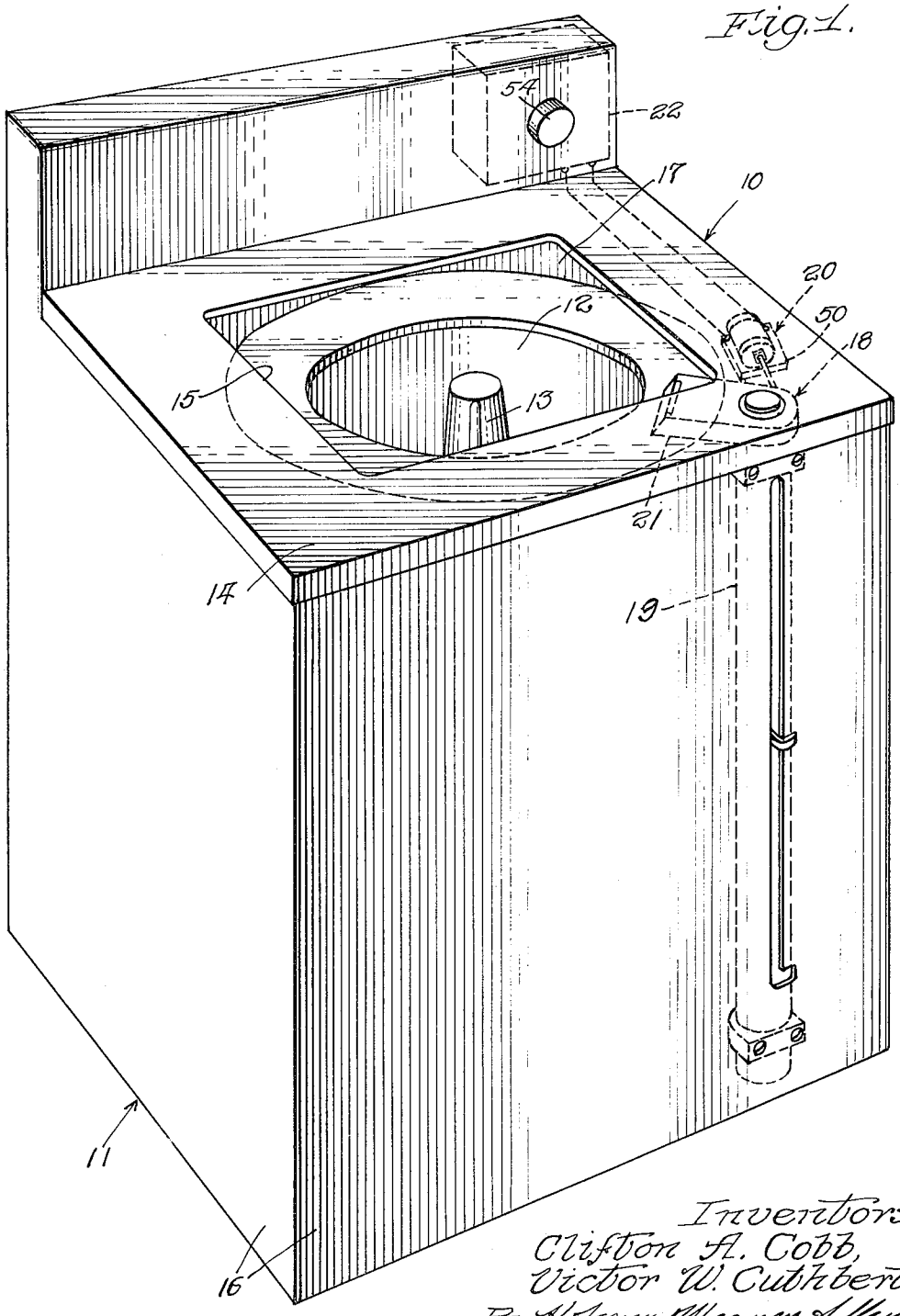
Feb. 8, 1966 C. A. COBB ET AL 3,233,778

PELLET DISPENSER

Filed Jan. 16, 1964 2 Sheets-Sheet 1

Fig. 1.



Inventors:
Clifton A. Cobb,
Victor W. Cuthbert,
By Hofgren, Wegner, Allen,
Stellman & McCord, Attys.

Feb. 8, 1966 C. A. COBB ET AL 3,233,778

PELLET DISPENSER

Filed Jan. 16, 1964 2 Sheets-Sheet 2

Fig. 2.

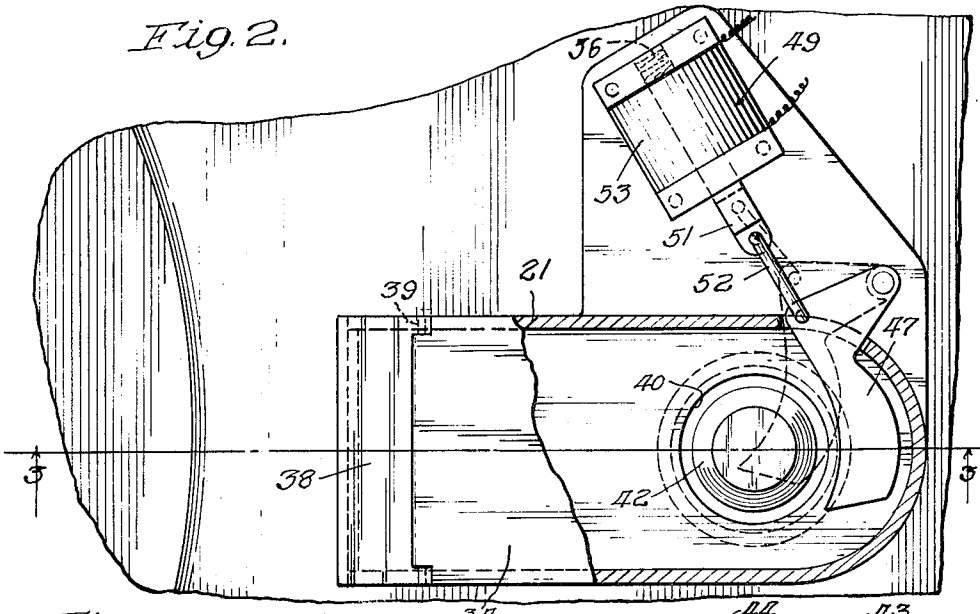


Fig. 3.

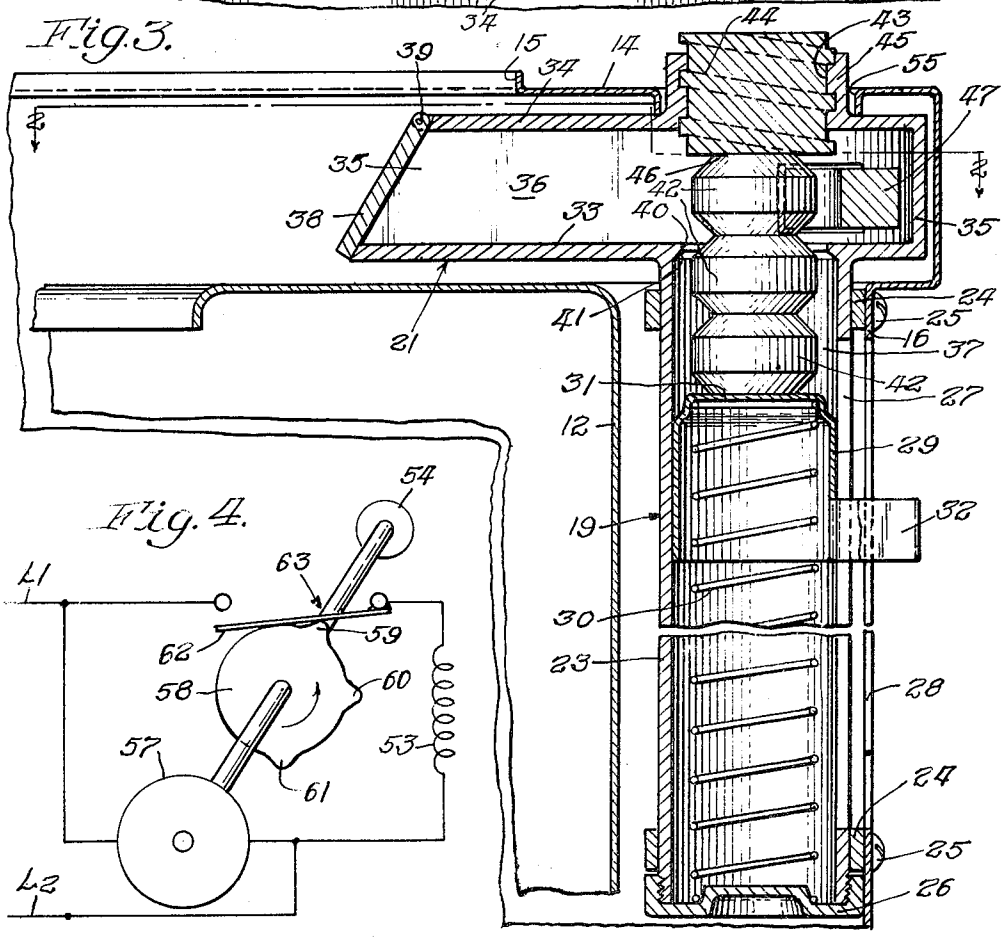


Fig. 4.

United States Patent Office

3,233,778

Patented Feb. 8, 1966

3,233,778

PELLET DISPENSER

Clifton A. Cobb, St. Joseph, and Victor W. Cuthbert, Sodus, Mich., assignors to Whirlpool Corporation, a corporation of Delaware

Filed Jan. 16, 1964, Ser. No. 338,187
4 Claims. (Cl. 221—232)

This invention relates to laundering apparatus and in particular to apparatus for dispensing laundering material into the tub of such laundering apparatus.

In one well known form of laundering apparatus, a tub is provided for holding fabrics and the like in a body of laundering liquid to effect a laundering thereof. The present invention comprehends the provision in such a laundering apparatus of new and improved means for delivering pellets of laundering material into the tub for use in the laundering operation. Illustratively, the invention comprehends such a means for providing detergent pellets into the tub for use in laundering fabrics and the like therein.

Thus, a principal feature of the present invention is the provision of a new and improved laundering apparatus.

Another feature of the invention is the provision of such a laundering apparatus having new and improved means for delivering pellets of laundering material into the tub of the apparatus.

A further feature of the invention is the provision of such laundering apparatus wherein the pellet delivering means comprises means defining a storage space for storing a plurality of pellets, means for urging the pellets seriatim outwardly from the storage space to an adjacent external space, and means for ejecting the pellets from the external space into the tub.

Yet another feature of the invention is the provision of such laundering apparatus further including means permitting only a preselected number of the pellets to be disposed in the external space at any one time.

A further feature of the invention is the provision of such laundering apparatus wherein means are provided for guiding the pellets from the ejecting means into the tub.

Still another feature of the invention is the provision of such laundering apparatus wherein means are provided at the distal end of the guide means for effectively closing the guide means at all times other than when a pellet is being ejected therethrough into the tub thereby to prevent the passage of liquids from the tub into the pellet delivering means.

A further feature of the invention is the provision of such laundering apparatus having new and improved means for controlling the operation of the delivering means for automatic delivery of a preselected number of such pellets to the laundering tub.

Still another feature of the invention is the provision of such laundering apparatus having new and improved means for controlling the delivering of the pellets from the storage space so that the pellets are accurately disposed therein for engagement by the ejecting means.

Yet another feature of the invention is the provision of such laundering apparatus having new and improved means for effecting a positive delivery of the pellets from the ejection space to the laundry tub.

Still another feature of the invention is the provision of such laundering apparatus which is extremely simple and economical to manufacture yet which is arranged for long, trouble-free life.

Other features and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

FIGURE 1 is a perspective view of a laundering apparatus provided with a pellet delivering means embodying the invention;

FIGURE 2 is a fragmentary horizontal section taken substantially along the line 2—2 of FIGURE 3;

FIGURE 3 is a fragmentary vertical section taken substantially along the line 3—3 of FIGURE 2; and

FIGURE 4 is a schematic electrical diagram illustrating a portion of the controller of the laundering apparatus.

In the exemplary embodiment of the invention as disclosed in the drawing, a laundering apparatus generally designated 10 is shown to comprise a cabinet 11 having a conventional upwardly opening laundering tub 12 in which is disposed a suitable agitating post 13 of conventional construction. As shown in FIGURE 1, the cabinet may include an upper wall member 14 provided with an opening 15 for access to the tub 12. The side walls 16 of the cabinet define an internal space 17 in which the tub 12 is disposed.

As indicated briefly above, the present invention comprehends the provision in laundering apparatus 10 of a pellet delivering apparatus generally designated 18 which is disposed within space 17 adjacent the tub 12. The pellet dispensing apparatus includes a pellet storage magazine 19, an ejecting device 20 for ejecting the pellets delivered from magazine 19, a guide 21 for guiding the pellets from the ejecting device into the tub 12, and a manually selectable control device 22 for controlling operation of the dispensing apparatus.

Reference now being had to FIGURES 2 and 3, the dispensing apparatus 18 may be seen in greater detail. More specifically, the magazine 19 includes a vertically extending tube 23. The tube 23 is secured at vertically spaced positions to the side wall 16 by means of a plurality of brackets 24 and suitable securing means such as screws 25. The lower end of the tube 23 is closed by a suitable closure 26 threadedly secured thereto. The tube 23 is provided with a vertical slot 27 extending from substantially the bottom of the tube to substantially the top thereof, and the cabinet side wall 16 is provided with a corresponding slot 28, similar to and aligned with slot 27.

A cup-shaped spring cap 29 is disposed slidably within tube 23 to open downwardly therein and is biased upwardly by a coil spring 30 seated on the closure 26 and engaging the underside of the top portion 31 of the cap. A tab 32 extends radially outwardly from the cap through the slots 27 and 28 to be accessible from exteriorly of the cabinet 11.

In the illustrated embodiment of the invention, the guide 21 comprises a horizontally extending extension of the tubular member 23. As best seen in FIGURE 3, the guide includes a lower wall 33 and an upper wall 34 spaced vertically apart by a side wall 35 to define an ejection space 36 externally of the storage space 37 defined by the magazine 19. As best seen in FIGURE 3, the distal end of the space 36 is normally closed by a flap 38 carried on the upper wall 34 by a suitable pivot 39.

The lower wall 33 of guide 21 is provided with an opening 40 at the upper end of magazine space 37, the opening being defined by an inturned shoulder 41 arranged to be engaged by the top wall 31 of the spring cap 29 when the cap is at the top of the magazine space 37, thereby to limit the upward movement of the cap and prevent it from moving outwardly from the magazine space 37. As shown in FIGURE 3, a plurality of pellets 42 may be stacked one on the other on top of the spring cap wall 31 to be urged seriatim by spring 30 into the ejection space 36.

Delivery of pellets 42 for loading the magazine 19 is effected through an opening 43 in the top wall 34 of the guide 21, which opening is normally closed by a closure

member 44 threaded to an upstanding boss 45 defining opening 43 in the top wall 34. The closure member extends downwardly to space 36 and by threadedly adjusting the closure member the lower surface 46 thereof accurately limits the upward movement of the pellets 42 so as to accurately locate the uppermost pellet in space 36 relative to a throwing arm 47 of the ejection device 20 disposed behind the pellet in space 36.

As best seen in FIGURE 2, the throwing arm 47 of the ejection device 20 is mounted for pivotal movement about a vertical axis on a pivot pin 48. A solenoid 49 is carried on a suitable bracket 50 within space 17 of the cabinet 11 and includes an armature 51 connected to the throwing arm 47 by a suitable link 52 to pivot the throwing arm from the full line position of FIGURE 2 to the dotted line position therein upon energization of the coil 53 of the solenoid. A return spring 56 is provided for biasing the armature 51 to full line position of FIGURE 2. Energization of the solenoid coil 53 is controlled by the sequential controller 22 which controls the laundry apparatus through the complete washing and extracting operation. The sequential controller 22 may be of a cam actuated switch type well known in the art. Through the use of knob 54, the sequential controller 22 may be preset to control the laundry appliance through the desired cycle. When the appropriate time for the addition of the pellet type additive is reached, the sequential controller 22 effects energization of solenoid coil 53, whereby the arm 47 is quickly thrown to the left as seen in FIGURE 2, and in turn throws the pellet disposed immediately in front of it through the guide space 36 and outwardly therefrom into the subjacent tub 12, the flap 38 being readily pivoted to an open position by the inertial force of the pellet as it is swung by the arm 47.

The operation of the pellet delivering apparatus 18 is extremely simple. As indicated briefly above, to load the magazine 19, the user merely removes closure 44 from opening 43, access to the closure being had by virtue of the extension of the boss 45 through a suitable opening 55 in the top wall 14 of the cabinet 11. The pellets are then inserted through the opening 45 downwardly onto the top wall 31 of the spring cap 29. The spring cap may be depressed manually by pressing down on the tab 32 to facilitate the loading operation. Upon completion of the loading operation, the closure 44 is reinstalled across opening 43 and is threaded downwardly sufficiently to position its lower surface 46 accurately relative to the thickness of the pellets 42 to dispose the uppermost pellet in accurate alignment with the arm 47. Thus, closure 44 provides an automatic adjustment means to accommodate different thickness pellets in the apparatus 18. In illustrating the invention, the effective height of the guide space 36 as determined by the positioning of the lower surface 46 of closure 44 is made to be suitable for a single pellet 42. Alternatively, however, a plurality of pellets may be disposed in the space, one above the other, by suitable dimensioning of the pellets and positioning of the surface 46.

To effect delivery of one or more pellets to the tub 12, the operator merely suitably positions knob 54 of sequential controller 22 to the appropriate position. Sequential controller 22 may be of any suitable construction well known to those skilled in the art arranged for single energization of the solenoid coil 53 or multiple, successive operations thereof, the number of such successive operations being preselected by suitable setting of the control knob 54. Illustratively, the controller 22 may be arranged, as shown in FIGURE 4, to include a timer motor 57 connected across power supply leads L_1 and L_2 for selectively driving a multi-lobed cam 58. In the illustrated embodiment, the cam includes three lobes 59, 60 and 61 which, during rotation of the cam, seriatim engage the moving contact 62 of a normally opened switch 63 connected in series with solenoid coil 53 across the power supply leads L_1 and L_2. Thus, the cam 58 may be arranged so as to deliver a first pellet such as a detergent pellet into the tub during a first, wash cycle portion of the operation of the apparatus. This would be effected by the rotation of the cam 58 sufficiently to cause lobe 59 to effect a first closing of the switch 63. The control may be further arranged so that lobe 60 substantially immediately after the first energization of the coil effects a second closing of the switch 63 to deliver a second pellet, such as a bleach pellet, into the tub at this time. After a predetermined interval during which the control 22 may effect subsequent drain and spin-dry operations of the apparatus by suitable additional conventional control structure (not shown), the cam 61 may effect a third closing of the switch 63 to effect a delivery of a third pellet into the tub. Illustratively, the third pellet may be a fabric conditioner pellet for treating the fabrics in the tub during a rinse cycle.

Alternatively, the control knob 54 may adjust the cam 58 so that only a single operation of the solenoid 49 is effected during the operation of the apparatus, or a plurality of pellets may be simultaneously delivered in a single operation of the solenoid 49 where a plurality are disposed in the guide space 36, as discussed above. In the illustrative embodiment of FIGURE 4, this may be accomplished by effecting rotation of the knob 54 to preset the cam at a point where only lobe 61 will subsequently engage the switch contact 62. It should be understood that the circuitry of FIGURE 4 is illustrative only and any other suitable controls for effecting selective individual or multiple pellet delivery as desired by the operator may be employed in the apparatus. In each case the energization of the solenoid causes the movement of the armature 51 into the coil 53 of the solenoid, thereby pivoting the throwing arm 47 quickly in a clockwise direction as seen in FIGURE 2. This movement of the arm 47 throws the pellet 42 through space 36 of guide 21 toward tub 12. The inertia of the pellet swings the flap 38 upwardly as the pellet leaves the space 36, whereupon the pellet is thrown into the tub 12. The flap 38 immediately swings back downwardly to close the front end of the space 36 and preclude passage of laundry liquid water vapors and the like backwardly from tub 12 and through space 36.

As the pellets are delivered seriatim from magazine 19 into the tub 12, the cap 29 moves upwardly carrying with it the tab 32. Thus, the position of the tab 32 which may be seen from externally of the cabinet 11 serves as an indication of the number of pellets remaining in the magazine. When the last pellet is delivered, the shoulder 41 limits the upward movement of the spring cap 31 so that inadvertent subsequent actuation of the throwing arm 47 will not damage the spring cap or throwing arm. Replenishing the stock of pellets 42 in magazine 19 is readily effected as discussed above by removing the closure 44.

While we have shown and described certain embodiments of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as defined in the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Means for dispensing pellets comprising: a housing having a first portion arranged to receive a plurality of pellets in stacked relationship and having a second portion defining an ejection chamber at one end of said first portion, said second portion of the housing further defining an ejection opening for passing pellets from said ejection chamber; means for urging a pellet stack in said first portion of the housing endwise from said first portion of the housing to dispose an end one of the stacked pellets in said ejection chamber, said ejection chamber having a height substantially greater than the height of the pellets; ejection means including an ejector member

selectively engaging said end one of said pellets in said ejection chamber of the housing and forcibly urging said end one of said pellets outwardly therefrom through said ejection opening, said ejector member moving to a position endwise of the remainder of the stack of pellets during its ejection of the endwise pellet; means on said second portion defining an inner stop surface and being adjustably positionable endwise of said stack to have end one of said pellets urged thereagainst to be accurately positioned in aligned relationship with said ejector member and inwardly of all portions of said second portion of said housing thereby to preclude undesirable deforming engagement of said end one of said pellets with the housing at said one end of the front portion thereof during ejection thereof; and control means for controlling operation of said ejection means.

2. The means for dispensing pellets of claim 1 wherein said control means includes means selectively settable to effect an ejection cycle wherein the ejection means is operated selectively any one of a preselected number of times and at preselected times to eject any one of a preselected number of pellets at said preselected times.

3. The means for dispensing pellets of claim 1 wherein said control means includes means selectively settable to effect an ejection cycle wherein the ejection means is operated selectively any one of a preselected number of times and at preselected times to eject any one of a preselected number of pellets at said preselected times, said control means further including a solenoid for operating the ejection means, and said settable means including a manually operable selector switch for automatically energizing the solenoid any one of a preselected number of times.

4. Means for dispensing pellets comprising: a housing having a first portion arranged to receive a plurality of pellets in stacked relationship, and a second portion defining an ejection chamber at one end of said first portion, said second portion of the housing further defining a first, access opening aligned with said first portion of the housing for introducing pellets seriatim therethrough into said first portion to be stacked therein, and a second,

ejection opening for passing pellets from said ejection chamber; means for urging a pellet stack in said first portion of the housing toward said first opening to dispose an end one of the stacked pellets in said ejection chamber, said ejection chamber having a height substantially greater than the height of the pellets; ejection means including an ejector member selectively engaging said end one of said pellets in said ejection chamber and forcibly urging said end one of said pellets outwardly therefrom through said second opening, said ejector member moving to a position endwise of the remainder of the stack of pellets during its ejection of the endwise pellet; a closure adjustably secured to said second portion to extend across said first opening and having an inner stop surface adjustably positionable endwise of said stack to have said end one of said pellets urged thereagainst to be accurately positioned in aligned relationship with said ejector member and inwardly of all portions of said second portion of said housing thereby to preclude undesirable deforming engagement of said end one of said pellets with the housing at said one end of the front portion thereof during ejection thereof; and control means for controlling the operation of said ejection means.

References Cited by the Examiner

UNITED STATES PATENTS

132,325	10/1872	Ryninger	221—232
1,814,929	7/1931	Hrissulakis	221—232
2,008,735	7/1935	Weiler	221—258
2,462,922	3/1949	Temple	221—232
2,621,655	12/1952	Olson	221—232
2,705,576	4/1955	Amelio et al.	221—232
2,752,061	6/1956	Michlein	221—258
3,036,731	5/1962	Cozart	221—258
3,040,934	6/1962	Weiner	221—241
3,062,030	12/1962	Groves	68—17

RAPHAEL M. LUPO, *Examiner.*

LOUIS J. DEMBO, *Primary Examiner.*