

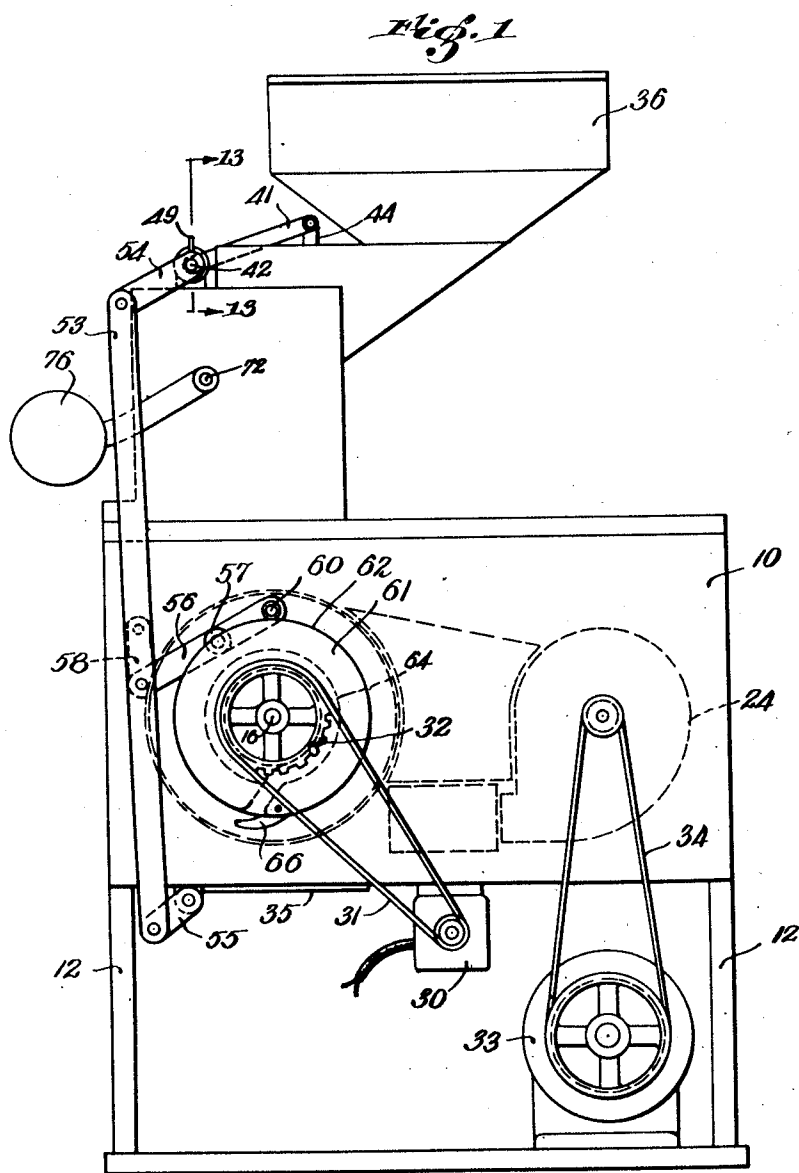
Sept. 12, 1950

H. M. HUSK ET AL
ROASTING METHOD AND MACHINE

2,522,448

Filed Sept. 28, 1946

7 Sheets-Sheet 1



Inventors:
Harry M. Husk,
Graydon Smith,
Robert H. Brown.
by Kenney & Wilton Attys

Sept. 12, 1950

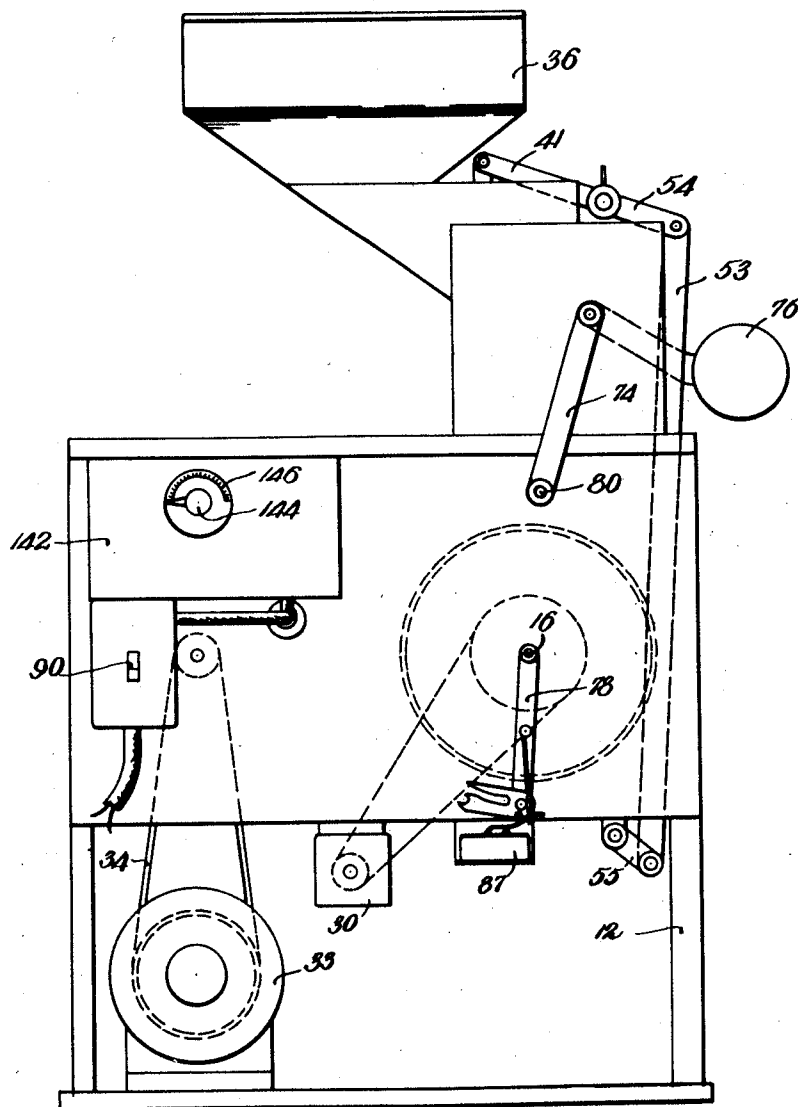
H. M. HUSK ET AL
ROASTING METHOD AND MACHINE

2,522,448

Filed Sept. 28, 1946

7 Sheets-Sheet 2

Fig. 2



Inventors:
Harry M. Husk,
Graydon Smith,
Robert H. Snow.
By Kenney & Witter *attys.*

Sept. 12, 1950

H. M. HUSK ET AL
ROASTING METHOD AND MACHINE

2,522,448

Filed Sept. 28, 1946

7 Sheets-Sheet 3

Fig. 3

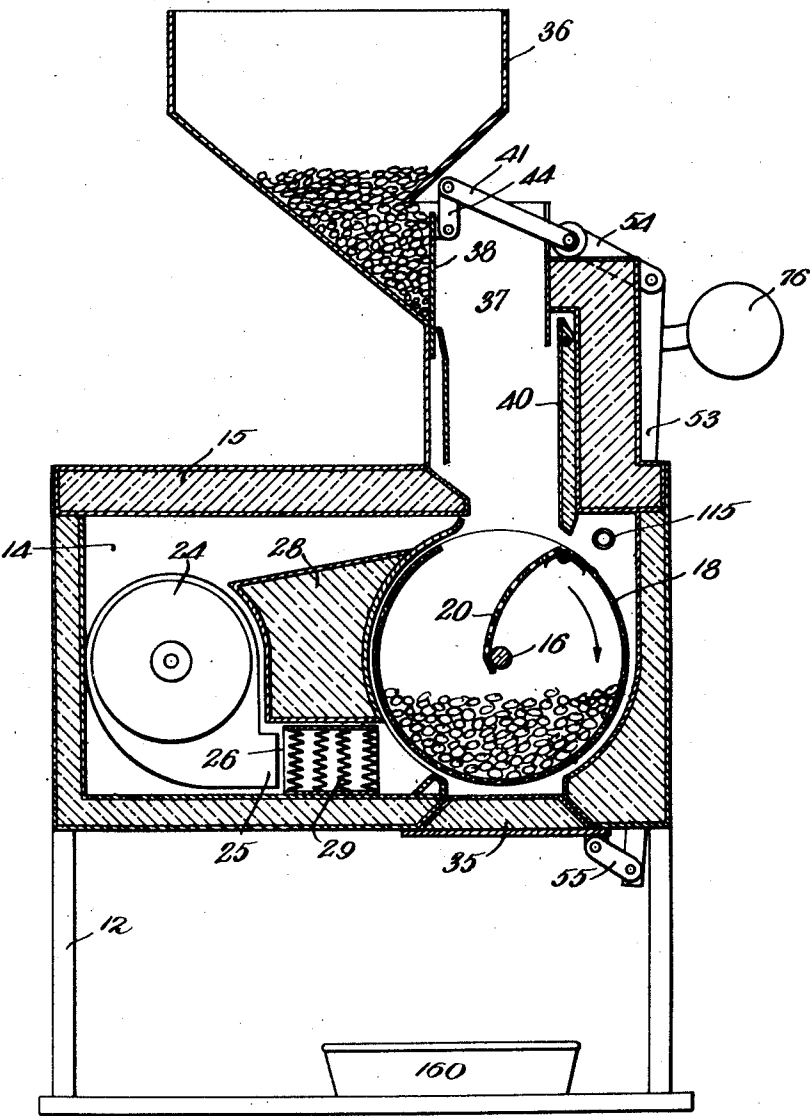
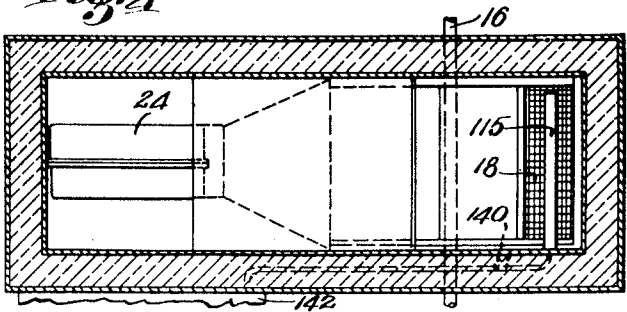


Fig. 4



Inventors,
Harry M. Husk,
Graydon Smith,
Robert H. Shaw.
by Kenway & Witter attys

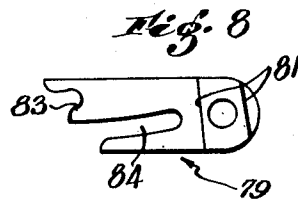
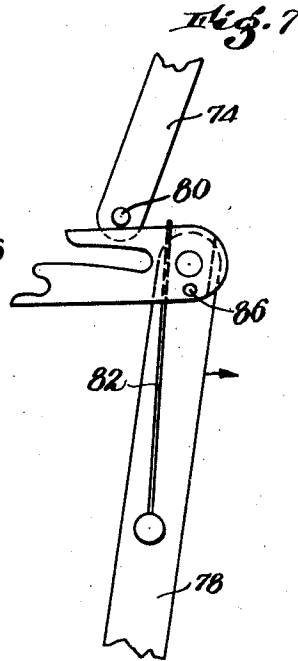
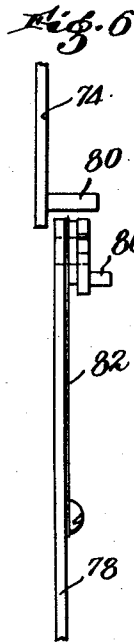
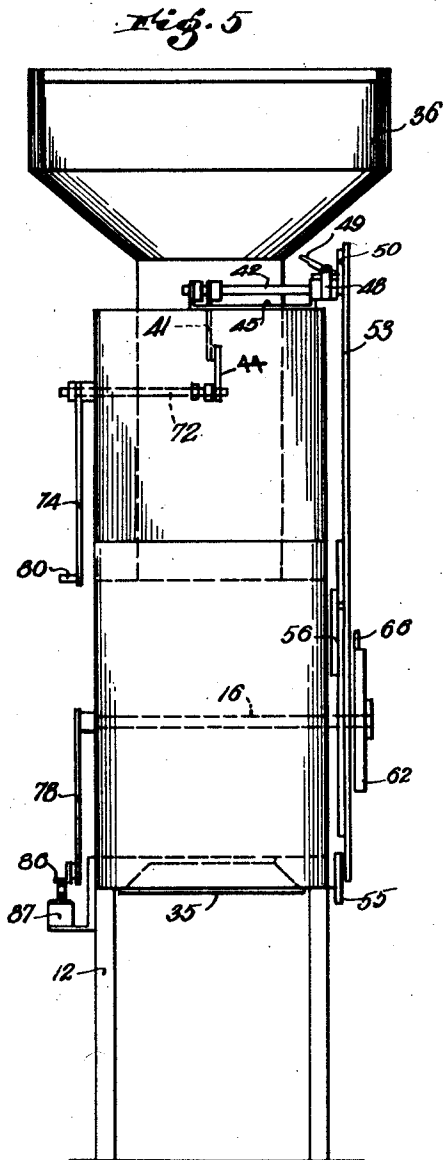
Sept. 12, 1950

H. M. HUSK ET AL
ROASTING METHOD AND MACHINE

2,522,448

Filed Sept. 28, 1946

7 Sheets-Sheet 4



Inventors:
Harry M. Husk,
Graydon Smith,
Robert H. Shaw.
by Kenway & Witter attys.

Sept. 12, 1950

H. M. HUSK ET AL

2,522,448

ROASTING METHOD AND MACHINE

Filed Sept. 28, 1946

7 Sheets-Sheet 5

Fig. 9

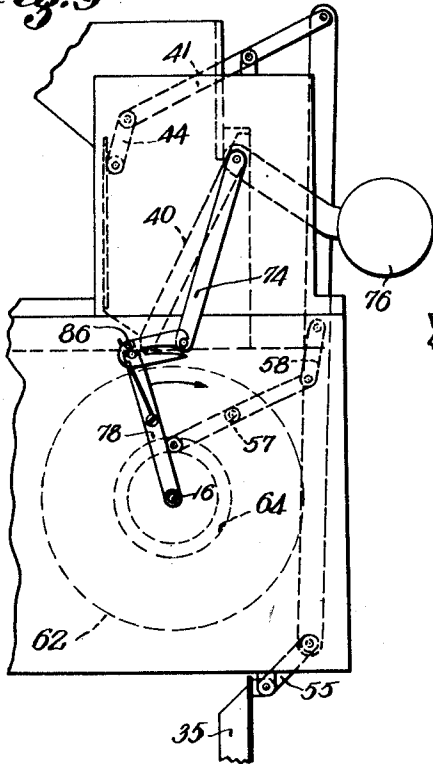


Fig. 10

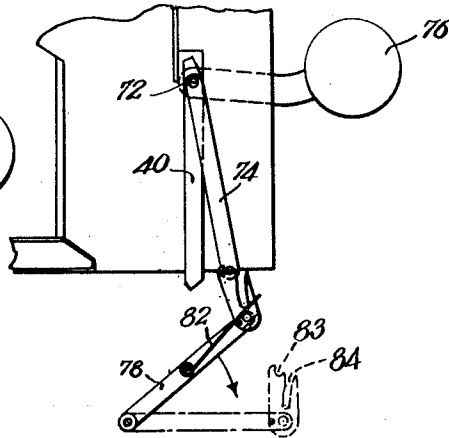


Fig. 11

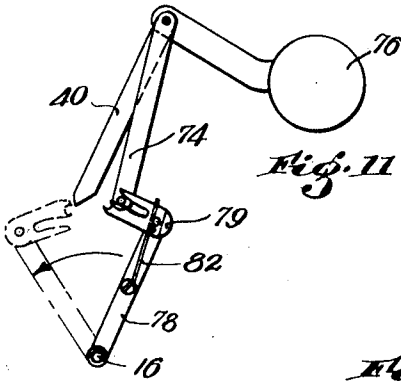


Fig. 12

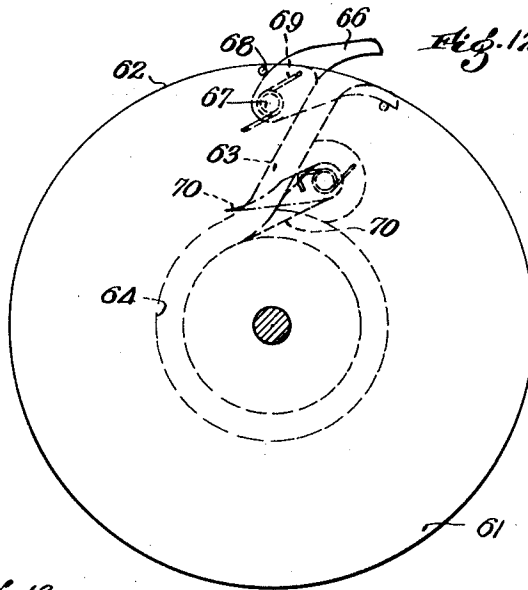
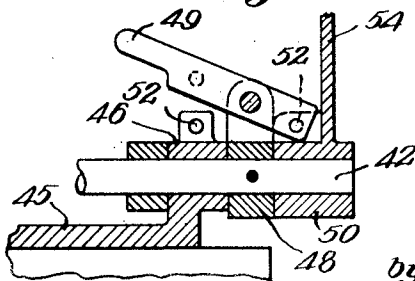


Fig. 13



Inventors:
Harry M. Husk,
Graydon Smith,
Robert H. Shaw.

by Kenway & Witter Attys

Sept. 12, 1950

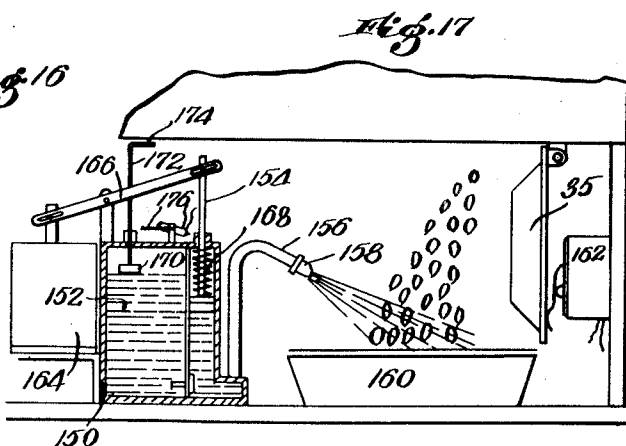
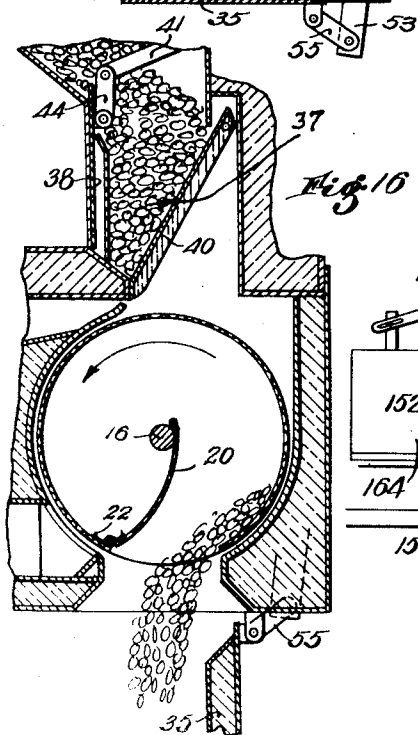
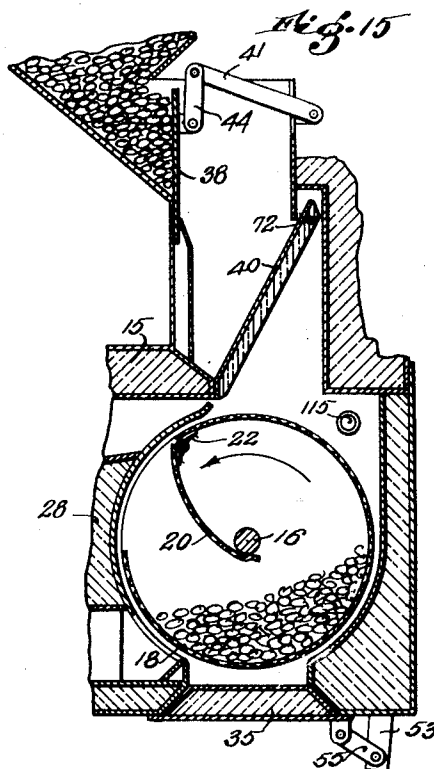
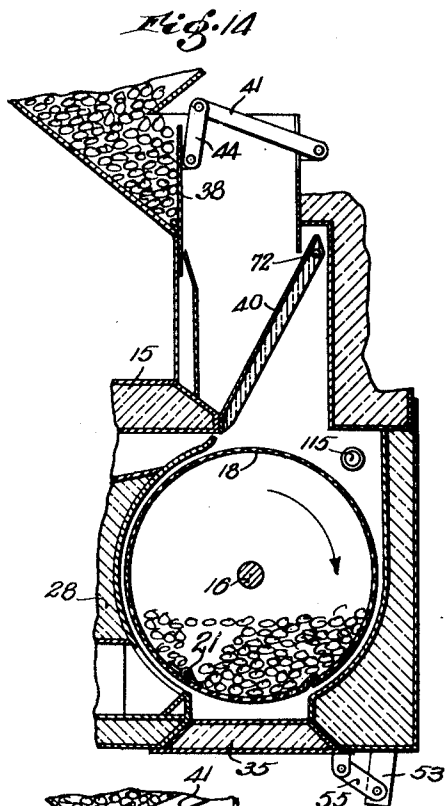
H. M. HUSK ET AL

2,522,448

ROASTING METHOD AND MACHINE

Filed Sept. 28, 1946

7 Sheets-Sheet 6



Inventors:
 Harry M. Husk,
 Graydon Smith,
 Robert H. Shaw.
 by Kenway & Witter attys

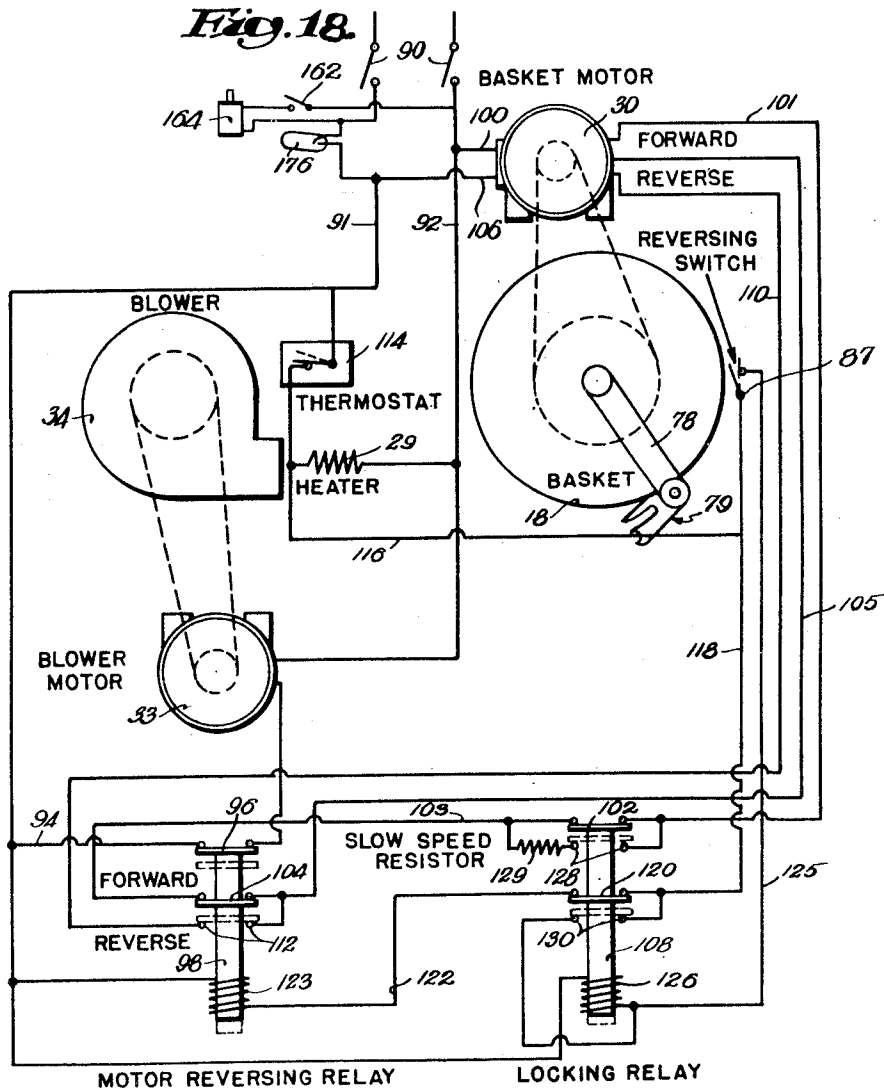
Sept. 12, 1950

H. M. HUSK ET AL
ROASTING METHOD AND MACHINE

2,522,448

Filed Sept. 28, 1946

7 Sheets-Sheet 7



Inventors
Harry M. Husk,
Graydon Smith,
Robert H. Shaw.

Kenway & Witter, Attorneys

UNITED STATES PATENT OFFICE

2,522,448

ROASTING METHOD AND MACHINE

Harry M. Husk, Newburyport, and Graydon Smith
and Robert H. Shaw, Concord, Mass., assignors
to Electricooker, Inc., Newburyport, Mass., a
corporation of Massachusetts

Application September 28, 1946, Serial No. 700,116

15 Claims. (Cl. 99—1)

1

This invention relates to a cooking or roasting method and machine in which the cooking of a product is effected within a closed chamber by a gaseous medium, preferably air, continuously circulated in an endless path within the chamber and through the product therein while providing additional heat to the cooking medium. The product is supported and agitated in a compartment within the chamber and the cooking medium is circulated through the agitated product. In the preferred form of the invention, the additional heat required is efficiently and conveniently supplied by a heater placed in the chamber, preferably forwardly of and adjacent to the product, and through which the medium is circulated to the product. The production of an improved cooking method and machine embodying these features comprises the primary object of the invention.

One embodiment of the invention contemplates the automatic cooking of the product in measured batches supplied from a hopper and includes means for automatically discharging a cooked batch from the chamber after a predetermined cooking and the subsequent transferring of a new and measured batch from the hopper to the chamber. The operations are preferably under the control of a thermostat disposed in or adjacent to the cooking medium and arranged automatically to provide predetermined heat to the cooking medium, discharge the cooked batch after predetermined cooking and place a new batch in the chamber. The production of such an automatic cooking machine comprises another object of the invention.

A further feature of the invention relates to a novel foraminous basket rotatably mounted in the cooking chamber and adapted continuously to tumble the product in one direction during circulation of the cooking medium therethrough and adapted automatically to discharge the product from the basket when the direction of rotation of the basket is reversed. The production of a combination of this nature together with means for automatically controlling the same in a manner adapted uniformly and continuously to cook successive batches of the product comprises a further object of the invention.

The invention is applicable to the cooking or roasting of coffee, nuts and like granular products and embodies various improvements and advantages over methods and machines heretofore employed for this purpose. Peanuts, cashews and other nuts have heretofore been cooked in a bath of oil or like liquid cooking medium and then

2

salted to produce what is commonly known as salted nuts. The oil thus employed not only adds additional expense to the process but is objectionable for numerous reasons. The oil boils off and produces an objectionable odor and a film or coating on adjacent articles such as fabrics and soft goods and renders them unsalable. The oil is a fire hazard, gums up and renders the machine unsanitary and very substantially increases the maintenance labor costs. The cooked product is saturated with oil and tends to rancidity when kept for some time before use. Our invention contemplates an improved method and machine in which the oil and its objectionable factors are eliminated and whereby is produced a cooked quality food product adapted to be salted, treated or flavored as desired and capable of maintaining its freshness during relatively long subsequent periods of storage. The production of a new and improved method and machine of this nature comprises a further object of the invention.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings in which:

Fig. 1 is a front elevation of a cooking machine embodying our invention,

Fig. 2 is a rear elevation of the machine,
Fig. 3 is a vertical sectional view therethrough,
Fig. 4 is a plan view with the top wall of the cooking chamber removed,

Fig. 5 is a front end elevation,
Fig. 6 is an enlarged edge view of a latch-operating mechanism,

Fig. 7 is a face view thereof,
Fig. 8 is a rear view of the latch,
Fig. 9 is a fragmentary view like Fig. 2 but showing the parts in another position,

Fig. 10 is a like view with the parts in a further advanced position,
Fig. 11 is a like view illustrating a further operation,

Fig. 12 is an enlarged view of a cam disk shown in Fig. 1,

Fig. 13 is an enlarged fragmentary sectional view taken on line 13—13 of Fig. 1,

Fig. 14 is a fragmentary vertical sectional view illustrating the cooking operation,

Fig. 15 is a like view showing the basket rotating in reverse direction,

Fig. 16 illustrates the discharging of a cooked batch from the basket,

Fig. 17 is a fragmentary view illustrating a

subsequent treatment of the cooked product, and Fig. 18 is a wiring diagram of the electric circuit and controls.

In the drawings 10 indicates a housing supported on legs 12 and having insulated walls providing a closed chamber 14. The top wall 15 is bodily removable to afford full access to the chamber. Disposed within the housing on a shaft 16 is a foraminous drum or basket 18 having a pivotally mounted gate 20 forming a portion of the periphery of the basket and adapted to open inwardly about an axis 21 parallel with the shaft 16, the gate being of a length to engage the shaft as a stop as shown in Fig. 3. A spring 22 normally holds the gate in the open position.

Also disposed within the chamber 14 is a blower 24 having its discharge end 25 directed into a passage 26 to the basket 18. A sheet metal form 28 disposed above the passage provides a barrier between the blower and basket. A heater, illustrated as a resistance coil 29, is mounted in the passage. The basket is driven from a motor 30 through a chain 31 to a sprocket 32 on the shaft 16. The blower is driven from a motor 33 through a belt 34. An opening through the bottom wall of the housing directly beneath the basket is normally closed by a pivotally mounted gate 35.

The removable top wall 15 carries a hopper 36 opening into a measuring chamber 37 disposed directly above an opening through the top wall 15 to the chamber 14 and basket 18. A vertically slidable gate 38 is carried by the hopper along its measuring chamber wall and a pivotally mounted gate 40 is carried by the opposite wall and provides a closure between the measuring chamber and the chamber 14. The gates 35 and 40 provide closures for the chamber 14 and are insulated to cooperate with the walls of the chamber and retain the heat therein.

The gate 38 is adapted to be operated by a lever 41 fixed to a shaft 42 and having its free end connected to the gate by a link 44. The shaft is rotatably supported in a bracket 45 on the wall 15 and extends through a collar 46 fixed to the bracket (Fig. 13). A second collar 48 fixed to the shaft carries a latch 49 adapted to be pivoted in opposite directions into engagement with a notch in the collar 46 or a notch in a collar 50 loose on the shaft, thus connecting the shaft with either collar 46 or 50. Spring-pressed detents 52 are adapted to hold the latch in either of these two positions. A relatively long and vertically disposed link 53 has its top end connected to the free end of a lever 54 fixed to the collar 50. The bottom end of the link 53 is connected to a link 55 rigidly attached to the gate 35. When the latch 49 is in the position of Fig. 13 upward movement of the link 53 is adapted to drop the gate 38 and open the gate 35 and downward movement of the link is adapted to close the gates in the opposite directions. The link 53 is automatically operated from the drum shaft 16 as hereinafter described.

The machine as herein illustrated and described is fully automatic to effect the roasting of successive batches of a product, such as nuts, coffee, etc., placed in the hopper. The machine is adapted automatically to conduct a measured quantity of the product from the hopper to the measuring chamber 37 (Fig. 16), deposit the same in the basket 18 (Fig. 3), roast the batch to a predetermined degree (Fig. 14) and then discharge the cooked batch (Fig. 16), it being un-

derstood that a successive batch is placed in the basket automatically following each cooked batch discharging operation. During the cooking operation the motor 30 rotates the basket in the direction of the arrow (Fig. 14) and when the batch is cooked the motor and basket are automatically reversed and the batch discharged (Figs. 15 and 16), it being apparent that contact of the batch with the gate 20 automatically closes the gate during the cooking operation when the basket rotates to a position placing the gate at the bottom of the basket.

A lever 56 is pivoted at 57 (Fig. 1) has one end connected by a link 58 to the long link 53. The other end of the lever carries a roller 60 adapted to ride in the cam path of a disk 61 fixed to the shaft 16. The cam path comprises outer and inner concentric portions 62 and 64 intersected by a connecting portion 63. A guiding piece 66 pivoted to the disk at 67 is normally held outwardly against a stop 68 (Fig. 12) by a spring 69. This guiding piece causes the roller to enter the path 63 from the path 62 when the basket and disk are rotated in the reversed direction (clockwise, Figs. 1 and 12) but permits the roller to pass upon rotation in the forward direction. A like guiding piece 70 cooperates with the roller to cause it to enter the path 63 from the path 64 when the disk and basket are rotated forwardly (anti-clockwise, Figs. 1 and 12) but permits the roller to pass upon rotation in the other direction. The arrangement is such that the roller is passed from the inner path to and remains in the outer path when the basket 18 is rotated forwardly (Fig. 3) and the roller is passed from the outer path to and remains in the inner path when the basket is rotated in the reversed direction (Figs. 15 and 16). When the roller is in the outer path the gates 35 and 38 are in closed position (Fig. 3) and when the roller is in the inner path these gates are open (Fig. 16).

The gate 40 is fixed to a shaft 72 having an arm 74 fixed to and depending from one end of the shaft, and the gate is normally moved to and held in closed position (Figs. 14-16) by a counterweight 76 on an arm fixed to the shaft. The gate is moved to the open position by means including an arm 78 fixed to the shaft 16 and carrying a latch 79 on its outer end for cooperating with a pin 80 carried by the arm 74, when the basket is rotated forwardly (Fig. 9). The latch 79 is pivoted to the arm 78 and is normally held in one of two positions 180° apart by a leaf spring 82 engaging two flats 81 on the latch. In one position (Figs. 2 and 9) a shallow recess 83 in the forward end of the latch is in position to engage the pin 80 and open the gate 40 when the basket is rotated in the forward direction. In the other position of the latch a deeper recess 84 is located to engage the pin and rotate the latch 180° (Fig. 11) to its other position when the basket is rotated rearwardly. A pin 86 on the latch is adapted to engage and trip a reversing switch 87 (Fig. 2) when the basket is rotated in the reversed direction.

In Fig. 18 is illustrated the wiring circuit and controls for the machine. Electric power is taken from a main line through a main switch 90 to leads 91 and 92. The blower motor 33 is in a circuit to these leads at 94 through a contact 95 of a motor reversing relay 98. The basket motor 30 is in a forward driving circuit 100, 101, contact 102 of a locking relay 103, 103, contact 104 of the relay 98, and return wires 105 and

106. Both relays are normally in the full line position of Fig. 18 wherein these circuits are closed and the motors operated. A reversing line for the motor 30 is provided at 110 through contact terminals 112 adapted to be closed by contact 104 when the relay 98 is drawn downwardly, and return wire 105.

The machine and circuit are primarily under the control of a thermostatically operated switch 114 having a controlling bulb 115 disposed in the cooking chamber 14 and preferably located adjacent to the basket 18 opposite to and remote from the passage 26. This switch is normally in closed position and is adapted automatically to open when the temperature in the chamber reaches a predetermined maximum. The switch 114 is in a circuit 116 to the line 91 and controls the heater 29 which cuts across from the wire 116 to the line 92. The wire 116 is connected to a wire 118 arranged to extend through a contact 120 on the relay 108 to a wire 122 and through the coil 123 of the relay 98 to the lead 91. The wire 118 is also connected to one terminal of the normally open switch 87 having the wire 125 from its other terminal extending through the coil 126 of the relay 108 and thence to the lead 91.

Cooperating with the contact 102 are contact terminals 128 and wires, including a resistor 129, to the lines 101 and 103 for shunting in the resistor and slowing the speed of the basket motor as hereinafter described. Cooperating with the contact 120 are contact terminals 130 and wires to the lines 118 and 125 for cutting the coil 126 into the circuit when the relay 108 is drawn downwardly, as hereinafter described.

The operation of the machine is substantially as follows. The cooking chamber 14 is first brought up to cooking temperature and this is effected by closing the main switch 90. The heater 29 thereupon becomes operative through the normally closed thermostatic switch 114, the blower motor 33 operates through a circuit 81, 94, 96 and 92, and the basket motor 30 is rotated forwardly through a circuit 100, 101, 102, 103, 104, 105 and 106. During this forward rotation of the basket the latch 79 is in the position of Fig. 7 wherein it passes the pin 80 without opening the gate 40. It will also be noted that during this forward rotation of the basket the roller 60 remains in the outer cam path 62 and maintains the gates 35 and 38 closed (Fig. 1). This condition prevails until the chamber reaches the predetermined maximum temperature at which the thermostat is set to open the switch 114. While the chamber is heating up the operator fills the hopper 36 with nuts or other product to be cooked.

When the temperature in the chamber reaches the predetermined maximum, the switch 114 automatically opens, thereby breaking the heater circuit and establishing a circuit 92, 29, 116, 118, 120, 122, 123 and 91 through and drawing the motor reversing relay 98 down to the broken line position of Fig. 18. This operation opens the blower motor circuit at 96 and reverses the basket motor 30 at 104 through contacts 112 and return lead 110. Reverse rotation of the basket causes the roller 60 to pass from the outer cam path 62 through the intermediate path 63 to the inner cam path 64, thereby lifting the link 53. This operation opens the gates 35 and 38 (the latch 49 being in the position of Fig. 13, whereupon the measuring chamber 37 fills from the hopper. During this reverse rotation the pin 80

is engaged within the deep slot 84 of the latch 79 and reverses the latch to the broken line position (Fig. 11). Reverse rotation of the basket continues until the pin 86 on the latch engages and temporarily closes the reversing switch 87 (Fig. 2).

Closing of the switch 87 establishes a circuit 92, 29, 116, switch 87, 125, 126 and 91 which draws the locking relay 108 downwardly to the broken line position of Fig. 18. This operation again reverses the basket motor to the forward direction by cutting the circuit through the coil 123 and reduces the speed of the basket motor by shunting in the resistor 129, and the closing of the contacts 130 establishes and maintains a circuit 92, 29, 116, 118, 130, 126 and 91 through the locking relay 108.

The basket thereupon rotates slowly forward. Such forward rotation causes the roller 60 to pass from the inner cam path 64 through the path 63 to the outer cam path 62, thereby pulling the link 53 downwardly. This operation closes the gates 35 and 38 (Fig. 1). When the basket opening provided by the open gate 20 arrives beneath the measuring chamber 37 the pin 80 is engaged within the shallow recess 83 of the latch 79 and opens the gate 40 (Fig. 9 and 10) whereupon the measured batch in the chamber 37 drops into the basket (Fig. 3). Continued movement of the arm 78 causes the latch engagement with the pin 80 to rotate the latch counterclockwise 180° to the position shown in broken lines in Fig. 10. The depositing of the new batch into the basket immediately cools the air in the cooking chamber whereupon the thermostat 115 closes the switch 114 and starts the heater, blower and cooking cycle. Closing of the switch 114 also returns the relay 108 to normal position whereupon the basket is rotated forwardly at normal speed during the cooking operation.

While we have herein illustrated and described the employment of switch 87 for reversing the rearward rotation of the basket to forward rotation and at the reduced speed described, it is pointed out that the machine will operate automatically without such switch and in some cases it may be desirable to eliminate the switch. In such case the basket will continue its rearward rotation until the temperature in the chamber drops sufficiently to effect closing of the switch 114 through the thermostat 115. The basket will thereupon be reversed to forward rotation at normal speed and the batch charging and cooking operations will automatically take place as above described. In the machine which we have constructed and operated in this manner the basket has reversed to forward rotation after rotating rearwardly about two turns following the discharging operation.

The gate 40 is automatically closed by the weight 76 when the latch 79 leaves the pin 80 and the basket continues its forward rotation for the cooking period during which the chamber 14 remains closed. This action also reverses the latch as illustrated in Fig. 10 to a position in which it thereafter passes the pin 80 in the forward direction without opening the gate 40 (Fig. 7). Rotation of the basket agitates the batch in the basket and the blower 24 continuously circulates the chamber air in an endless path through the heater passage 26, into the basket 18 and through the product to be cooked, and from thence back to the blower, as indicated by the arrows in Fig. 14. Locating of the blower passage 26 and heater 29 adjacent to and directed toward the bottom por-

tion of the basket causes the heated air to have direct and immediate cooking contact with the agitated product and in a direction opposed to the movement of the product toward the heater as the basket is rotated forwardly during the cooking operation (Fig. 3 and 14). The air continues from the product through an endless path in the chamber and back to the blower, as indicated by the arrows.

It will be apparent that a load of one pound will require less cooking time, on the same thermostat setting and using the same heat source, for the reason that the larger volume absorbs more heat units and requires a longer period to complete the cook as compared with a smaller volume. The cooking time required depends upon the amount of heat delivered to the product and this will vary with the speed of air circulation, with a variation in the voltage of the heating circuit, etc. Thus, timing or a time period control does not enter into this method in which the cooking is predetermined and controlled by the amount of heat delivered to the product. During the cooking period the thermostat automatically controls the heater 29 to provide the necessary additional heat to effect the cooking.

When the machine begins its forward and cooking operation, the roller 60 is engaged by the guiding piece 70 which thereupon directs the roller from the cam path 64 into the cam path 63 and from thence the roller passes outwardly to the outer path 62. This operation moves the link 53 downwardly and closes the gates 35 and 38 to the position of Fig. 3.

When the temperature in the chamber again reaches the predetermined maximum at which the cooking is completed, the thermostat automatically opens the switch 114. This operation establishes the circuit 92, 29, 116, 118, 120, 122, 123 and 91 through and draws the motor reversing relay 98 down to the broken line position of Fig. 18. This operation opens the blower motor circuit at 96 and reverses the basket motor 30 at 104 through contacts 112 and return lead 110. Reverse rotation of the basket causes the roller 60 to pass from the outer cam path 62 through the intermediate path 63 to the inner cam path 64, thereby lifting the link 53 and opening the gates 35 and 38. Reverse rotation of the basket (Fig. 15) continues until the pin 86 on the latch 79 engages and temporarily closes the reversing switch 87 (Fig. 2). During this operation the cooked batch is automatically discharged from the basket and chamber as illustrated in Figs. 15 and 16. Subsequently, the temporary closing of the switch 87 again establishes the circuit 92, 29, 116, 87, 125, 126 and 91 as heretofore described whereupon the measured batch in the chamber 37 is deposited into the basket and the cooking cycle is repeated.

A tube 140 extends from the bulb 115 to a controlling switch within a control box 142. The predetermined setting of the control switch can be adjusted manually by a knob 144 having an index operating over a scale 146.

When operating the machine for continuously cooking successive batches of the product, the latch 49 is placed in the position of Fig. 13. Should it be desired to discontinue the cooking operation without stopping the machine and while a quantity of the product remains in the hopper 36, the latch is moved anti-clockwise to its other position. In this latter position the gate 38 is locked in raised position (Figs. 14 and 15) and the collar 50 is free to turn on the shaft 42.

In Fig. 17 we have illustrated a further feature of the invention for automatically seasoning each cooked batch of the product when it is discharged from the cooking chamber. This apparatus comprises a housing 150 provided with a reservoir 152 for holding the seasoning liquid. A pump 154 is adapted to force the liquid through a pipe 156 and a nozzle 158 onto the product in the pan 160. When the door 35 opens it engages and closes a momentary switch 162 in circuit to a solenoid 164. The solenoid thereupon operates through a pivoted lever 166 to raise the pump plunger thereby compressing a spring 168 and drawing a predetermined quantity of the seasoning liquid into the pump chamber. When the switch opens the spring forces the plunger downward and sprays the liquid onto the cooked product.

Means is also illustrated in Figs. 17 and 18 for stopping operation of the machine should the seasoning liquid in the reservoir 152 reach a predetermined low level. This means comprises a float 170 on a rod 172 having its top end 174 arranged to engage and open a pivotally mounted mercury switch 176 when the float drops to such low level. The switch is normally closed and is adapted to be opened when tipped anti-clockwise. This switch can be arranged in the circuit as illustrated in Fig. 18 or in any other convenient manner for performing the desired function.

Our invention as herein disclosed is adapted to the automatic and economical roasting of numerous and various products such as shelled and unshelled nuts, coffee beans, etc. No liquid cooking medium is employed, whereby eliminating substantial costs for oil and like cooking liquids, heretofore used especially in the cooking of shelled nuts, and eliminating fire and injury hazards, objectionable odors and fumes, unsanitary and functional contamination of equipment, and the high labor costs due to the objectionable task of keeping the equipment clean. Cooking efficiency and fuel economy are also effected by wholly enclosing the heating and cooking within a closed chamber and maintaining and circulating a gaseous cooking medium therein. The invention furthermore produces a superior fresh roasted product free from contamination of cooking oils, adapted to maintain its freshness indefinitely and adapted to be treated by the merchandizer or consumer with such seasoning or flavoring compositions as may seem desirable.

While we have herein more specifically illustrated and described our invention in connection with cooking by convection through the heating and circulating of a gaseous medium through the product to be cooked, we desire it to be understood that in its broader concept the invention is not to be considered as thus limited since it is also applicable to cooking by radiation or conduction. It will for example be apparent that radiant heat from wires or other elements heated to incandescence might be employed or cooking heat can be applied to the product in any other suitable and efficient manner. We desire furthermore to emphasize that, while we have herein more specifically described the invention in association with the cooking of nuts, the invention is not to be considered as limited thereto since it is equally applicable to the cooking of numerous other products of a like nature.

Having thus disclosed our invention what we claim as new and desire to secure by Letters Patent is:

1. A cooking machine comprising a housing providing a chamber within insulated walls, a

foraminous basket mounted to rotate in the chamber about a substantially horizontal axis, means providing charging and discharging openings through the chamber walls respectively above and below the basket and a cooperating opening into the basket, means associated with the charging and basket openings for depositing into the basket a measured quantity of nuts or the like to be cooked and including a gate for thereafter closing the charging opening, means including a shaft extending through a wall of the chamber for rotating the basket and agitating the nuts therein, a gate for closing the basket opening, and means in the chamber including heating means laterally of said axis and the basket for heating the air therein to cooking temperature and circulating it in an endless path within the chamber including in one part thereof adjacent to and laterally of the basket a channel through which the heated air is directed laterally of said axis to, through and in contact with the agitated nuts in the basket.

2. The machine defined in claim 1 in which said heating means is located in said one part of said endless path and supplies additional heat to said air directly prior to its contact with the agitated nuts.

3. The machine defined in claim 1 in which said basket opening is through the peripheral wall of the basket and for discharging them through said discharging opening, and means associated with and controlled by rotation of the basket for opening the first named gate automatically when the basket opening passes therebeneath following the discharging of a charge of nuts from the basket.

4. The machine defined in claim 3 plus means for rotating the basket forwardly during the cooking operation, a thermostat under control of the temperature in the chamber for causing reverse rotation of the basket and discharging of the nuts therefrom after predetermined cooking, and means under control of said thermostat for automatically causing forward rotation of the basket following said discharging of the nuts.

5. The machine defined in claim 4 plus a hopper above the first named gate, and means associated with and controlled by rotation of the basket for depositing a measured quantity of nuts automatically from the hopper to the first named gate following the closing of the first named gate.

6. The machine defined in claim 1 plus means associated with and controlled by rotation of the basket for opening the first named gate automatically when the basket opening passes therebeneath following the discharging of a charge of nuts from the basket, means for rotating the basket forwardly during the cooking operation, a thermostat under control of the temperature in the chamber for causing reverse rotation of the basket and discharging of the nuts therefrom after predetermined cooking, and means including an electric switch under control of the basket rotation for automatically causing forward rotation of the basket following said discharging of the nuts.

7. The machine defined in claim 1 plus means for rotating the basket forwardly during the cooking operation, a thermostat under control of the temperature in the chamber for causing reverse rotation of the basket and discharging of the nuts therefrom after predetermined cooking, means under control of said thermostat for automatically causing forward rotation of the basket following said discharging of the nuts, and means

including an arm rotatable with the basket and a latch carried by the arm for cooperating with and opening the first named gate when the basket opening passes therebeneath during forward rotation of the basket following the discharging of a charge of nuts therefrom.

8. The machine defined in claim 7 in which said latch is pivoted to said arm and its cooperation with the first named gate upon forward rotation of the basket reverses the pivotal position of the latch, and means for returning the latch to its original position upon reverse rotation of the basket.

9. The machine defined in claim 1 plus means for rotating the basket forwardly during the cooking operation, means including a thermostat under control of the temperature in the chamber for causing reverse rotation of the basket and discharging of the nuts therefrom after predetermined cooking, means including an electric switch for automatically causing forward rotation of the basket at reduced speed following said discharging of the nuts, and means associated with and controlled by rotation of the basket for opening the first named gate automatically when the basket opening passes therebeneath following the discharging of a charge of nuts from the basket, cooling of said air by the charge of nuts deposited into the basket being adapted through said thermostat to return the forward rotation of the basket to normal speed.

10. A cooking machine comprising a housing having a chamber within insulated walls, a rotary foraminous basket in the chamber, means providing charging and discharging openings through the chamber walls, respectively above and below the basket means providing a cooperating opening through the basket and a gate therefor, a hopper, means including a gate at the charging opening providing a measuring compartment between the hopper and the charging opening, means normally holding the second named gate closed, a shaft outside the chamber and extending through the wall thereof for rotating the basket and agitating a batch of nuts therein, means in the chamber including portions of the inner faces of said walls for heating the air therein to cooking temperature and circulating it in an endless path within the chamber including in one part thereof adjacent to the basket a channel through which the heated air is directed to, through and in contact with the agitated nuts in the basket, means including a thermostat in the chamber for discharging the nuts from the basket through the discharging opening when said air reaches a predetermined temperature, means controlled by rotation of said shaft for thereafter opening the second named gate automatically and discharging into the basket the nuts in the measuring compartment, and means also under control of said shaft for filling the measuring compartment automatically from the hopper following the closing of the second named gate.

11. A method of cooking nuts by contact therewith of air enclosed in a cooking chamber excluded from the outside atmosphere, which consists in supporting and mechanically agitating the nuts on a moving surface and confined within an inner and smaller space within the cooking chamber, and cooking the nuts by circulating said air through an endless path within the cooking chamber including in one part thereof a heating zone adjacent to the confined nuts and through which the air is directed to, through and in con-

11

tact with the agitated nuts in said smaller space, said moving surface agitating the nuts independently of the air flow and passage of the air through said heating zone being adapted to raise the air to nut cooking temperature.

12. A method of cooking nuts by contact therewith of air enclosed in a cooking chamber excluded from the outside atmosphere, which consists in supporting the nuts on an endless moving surface and confined within an inner and smaller space within the cooking chamber and thereby mechanically tumbling the nuts, and cooking the nuts by circulating said air through an endless path within the cooking chamber and including in one part thereof a heating zone adjacent to the nuts and through which the air is directed to, through and in contact with the tumbling nuts, said moving surface tumbling the nuts independently of the air flow and passage of the air through said heating zone being adapted to raise the air to nut cooking temperature.

13. The method defined in claim 12 in which the nuts are tumbled in one direction about a substantially horizontal axis extending through said inner space and in which air from said heating zone is directed against the nuts in opposed relation to their movement toward said heating zone.

14. A method of automatically cooking successive batches of nuts by contact therewith of air enclosed in a cooking chamber excluded from the outside atmosphere, which consists in transferring from a nut supply to a smaller space within said cooking chamber a measured quantity of nuts, confining and mechanically agitating the nuts on a moving surface in said smaller space, cooking the nuts by circulating said air through an endless path within the cooking chamber including in one part thereof a heating zone adjacent to the nuts and through which the air is directed to, through and in contact with the agitated nuts, said moving surface agitating the nuts independently of the air flow and passage of the air through said heating zone being adapted to raise the air to nut cooking temperature, automatically discharging the nuts after a predetermined cooking thereof, and automatically trans-

12

ferring a measured batch of nuts from the nut supply to the smaller space following the discharging operation.

15. The method defined in claim 14 in which the nuts are discharged when the temperature in the cooking chamber reaches a predetermined maximum and in which said measured batch is thereafter transferred to said smaller space following a predetermined drop in temperature in the cooking chamber.

HARRY M. HUSK.
GRAYDON SMITH.
ROBERT H. SHAW.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
346,344	Bailey	July 27, 1886
502,283	Crompton	Aug. 1, 1893
727,674	North	May 12, 1903
849,581	Spencer	Apr. 9, 1907
994,717	Bullis	June 13, 1911
1,531,257	Brockett	Mar. 24, 1925
1,562,531	Watkins	Nov. 24, 1925
1,643,056	Cibel	Sept. 20, 1927
1,648,005	Pritchard	Nov. 8, 1927
1,730,550	Yamada	Oct. 8, 1929
1,943,211	Dent	Jan. 9, 1934
1,981,603	Mustonen	Nov. 20, 1934
1,991,190	Backer et al.	Feb. 12, 1935
2,129,673	Burns	Sept. 13, 1938
2,172,603	Adams et al.	Sept. 12, 1939
2,185,878	Adams et al.	Jan. 2, 1940
2,188,969	Waldvogel	Feb. 6, 1940
2,284,096	Kennedy	May 26, 1942
2,301,922	Atti	Nov. 17, 1942
2,314,748	White	Mar. 23, 1943
2,326,094	Cusack et al.	Aug. 3, 1943
2,360,838	Atti	Oct. 24, 1944
2,381,493	Goldfine	Aug. 7, 1945
2,389,577	O'Toole et al.	Nov. 20, 1945
2,398,880	Broglie	Apr. 23, 1946
2,418,239	Smith	Apr. 1, 1947

Certificate of Correction

Patent No. 2,522,448

September 12, 1950

HARRY M. HUSK ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 9, lines 30 and 31, strike out the words "and for discharging them through said discharging opening";

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of December, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.