

April 27, 1937.

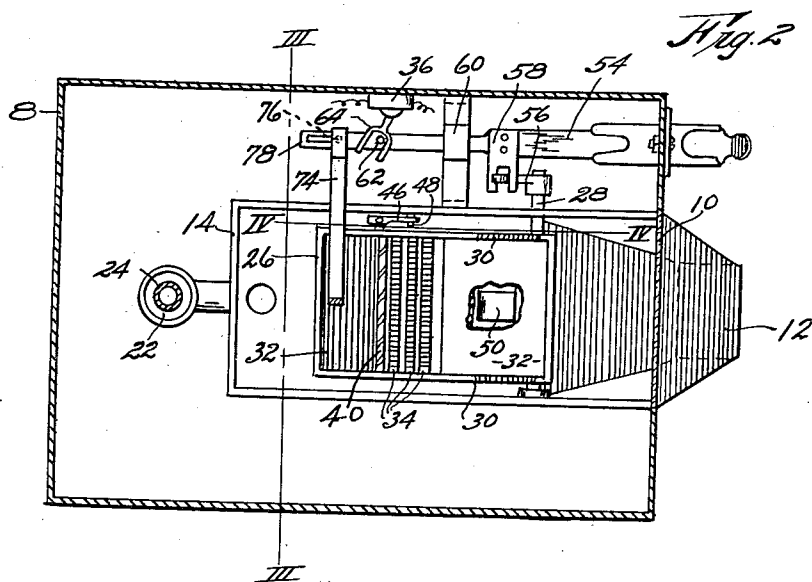
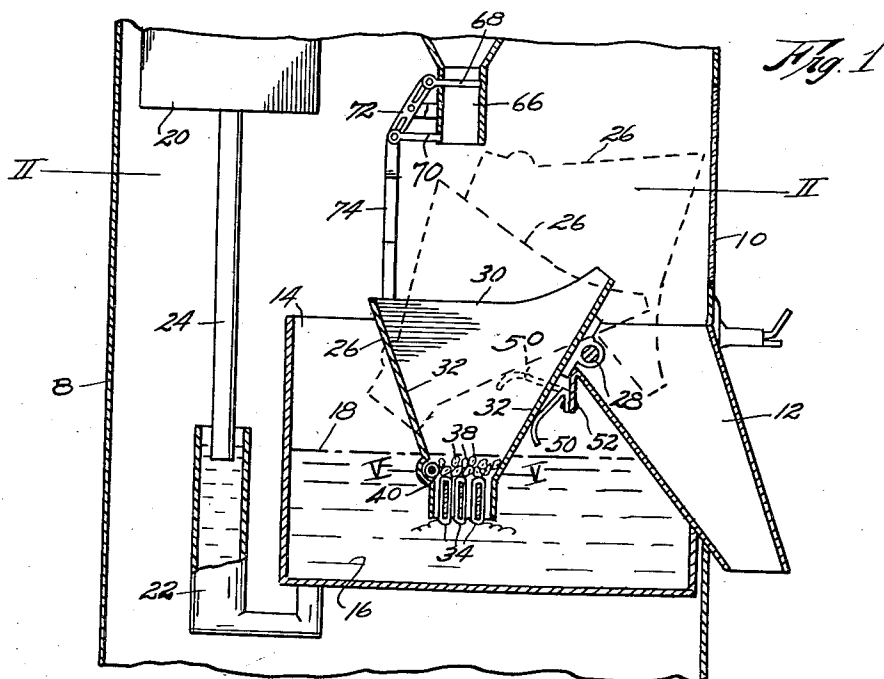
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2,078,719

CORN POPPING MACHINE

Filed July 13, 1936

2 Sheets-Sheet 1



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Fig. 3

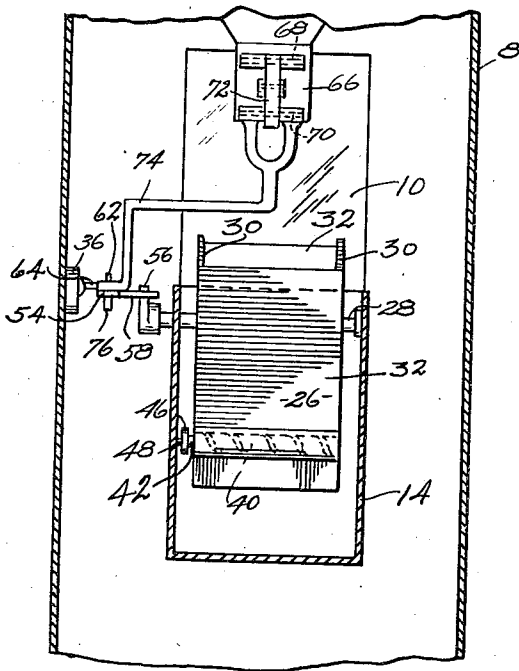


Fig. 4

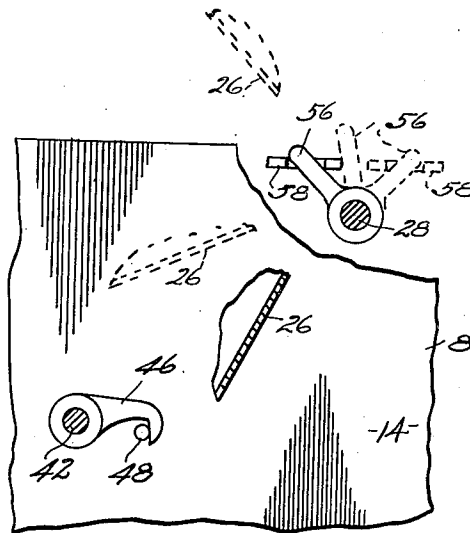


Fig. 5

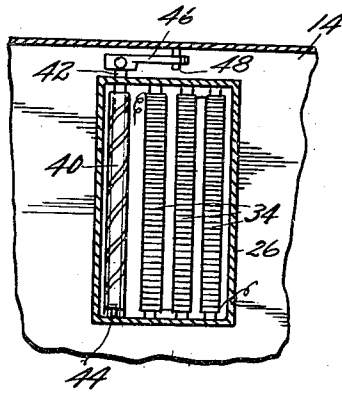
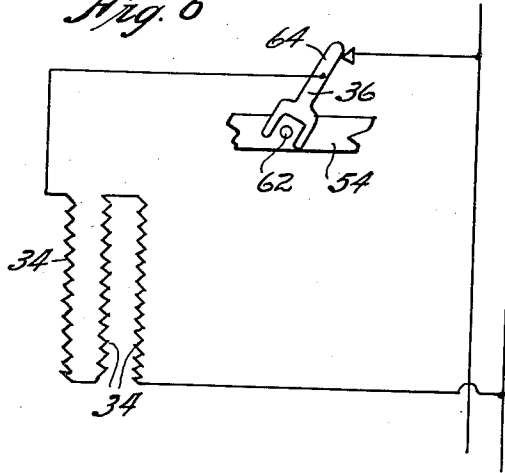


Fig. 6



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UNITED STATES PATENT OFFICE

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CORN POPPING MACHINE

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Application July 13, 1936, Serial No. 90,317

11 Claims. (Cl. 53—4)

This invention relates to corn popping machines of the character disclosed in my co-pending application Serial Number 750,946, filed November 1, 1934, and this invention is a continuation-in-part of the disclosure just identified.

One of the important aims of this invention is to provide in corn popping machines, a group of mechanical elements, the major portion of which are operated when the coin slide of the machine is manually manipulated, said elements all being compactly assembled and combined in a unique manner so that a more efficient machine is produced.

A yet further aim of the instant invention is to provide a corn popping machine, having as one of its most important parts, a multiple hopper, the bottom of which is formed of a plurality of heating elements upon which the unpopped kernels of corn must rest while the machine is operating, said unpopped kernels and the heating elements both being bodily submerged below the level of a volume of liquid so that the corn may be popped without agitation and without danger of burning.

A still further object of the invention is to provide improvements in the process of popping corn which include the steps of segregating a relatively small amount of popping oil from a larger amount within a reservoir thereof, and then applying heat to the lower portion of the segregated smaller volume so that corn may be popped in an appreciable amount of popping oil without the necessity of raising the temperature of the entire volume thereof high enough to effect popping of the corn.

The machine contemplated by this invention includes a large number of specific structural details, all of which form minor objects of the invention, and such objects will manifest themselves by a reading of the following specification, referring to the accompanying drawings, wherein:

Figure 1 is a fragmentary, vertical, central sectional view through a corn popping machine made to embody this invention.

Fig. 2 is a cross section through the same, taken on line II—II of Fig. 1.

Fig. 3 is a fragmentary, vertical section through a portion of the machine, taken on line III—III of Fig. 2.

Fig. 4 is an enlarged, fragmentary, sectional view, taken along line IV—IV of Fig. 2.

Fig. 5 is a similar view through the bottom of the hopper, taken on line V—V of Fig. 1, and,

Fig. 6 is a wiring diagram illustrating the man-

ner in which the heating elements are supplied with current.

Corn popping machines of the nature embodying the present invention should include the conventional case 8, formed of sheet metal and provided with windows 10, if desired. A delivery chute 12 extends exteriorly of case 8 so that the popped corn might be carried to a point accessible to the operator, and a reservoir 14, filled with popping oil 16 to the level 18, is housed by a case 8. A tank 20, joined to reservoir 14 by the goose neck 22 and pipe 24, automatically maintains level 18 so long as there is a supply of popping oil in tank 20. Hopper 26, swingably mounted upon a shaft 28, is movable from the position shown in full lines of Fig. 1 to the two positions shown in dotted lines of said figure.

This hopper is a specially formed part of the machine and comprises parallel sides 30 and inclined ends 32 that converge toward each other as the lower portion of hopper 26 is approached. This hopper is open at its top so that a charge of corn may be dropped therein when the hopper assumes the proper position, and the otherwise open bottom of hopper 26 is partially closed by a plurality of heating elements 34, connected in a circuit with switch 36 that makes and breaks the circuit as the machine is operated.

Heating elements 34 may be merely strips of insulating material extending in parallelism across the bottom of hopper 26 and wound with resistance wire of conventional characteristics. The distance apart of heating elements 34 should not be great enough to permit unpopped kernels of corn 38 to drop out of hopper 26, and when hopper 26 is in the normal position, walls 30 and 32 and heating elements 34 set off or segregate a small quantity of oil 16, which is quickly heated to a temperature high enough to pop kernels 38 without the necessity of raising the temperature of all of the popping oil.

In corn popping machines wherein my method of popping corn is employed, a small amount of oil is carried out of the reservoir each time a charge of corn is popped. Popping the corn through structure just mentioned does not require the heating of a large volume of oil, and as the small quantity of oil confined within hopper 26 is consumed or removed by the popping kernels, an additional amount is supplied through the interstices between heating elements 34.

A spirally wound, thermostatic strip 40 is mounted within hopper 26 between level 18 and heating elements 34 so that the temperature of the relatively small quantity of oil governs its

action. One end of thermostatic strip 40 is secured to stub shaft 42, while the other end is anchored as at 44 directly to one side 30 of hopper 26. As the temperature rises and falls, strip 40 will rotate shaft 42 and move latch member 46 to and from a position where it may be engaged by pin 48. A spring 50, anchored at its one end as at 52, and having its free end bearing against one of the inclined sides 32 of hopper 26, has a tendency to lift hopper 26 to the intermediate position as soon as latch 46 is disengaged from pin 48. After spring 50 has so functioned, manual manipulation of coin slide 54 may move hopper 26 to the dumping position. Coin slide 54 is of the conventional type well known in the art and the same is operatively joined to shaft 28 through the medium of arm 56 and notched plate 58. Arm 56 is mounted upon shaft 28 and in engagement with notched plate 58 so that as slide 54 is reciprocated, shaft 28 is rotated to move hopper 26. A continuation of slide 54 is reciprocally journaled in a bearing 60, and a pin 62 thereon engages bifurcated arm 64 of spring 36. Switch 36 is of the "snap" type so as to effect quick make and break.

Means for introducing a charge of unpopped corn into hopper 26 is disposed above the latter and comprises a measuring throat 66, having upper and lower slides 68 and 70 respectively, that are alternately in a position to close throat 66. A link 72, pivotally mounted intermediate its ends, joints slides 68 and 70 and an arm 74 is connected to lower slide 70 and also to the extended portion of slide 54 through the medium of a pin 76 that extends through slot 78.

Operation

Assuming that the parts of the machine have just reached the positions illustrated in Figs. 1, 2 and 3, it is obvious that corn 38, submerged in the small quantity of popping oil and supported directly by heating elements 34, will quickly pop without agitation and without burning. This popping will project the popped kernels upwardly above the surface of oil 16 where they will remain by flotation until the entire charge is popped. The temperature reached by that small quantity of popping oil above elements 34 will always be the same after the charge of corn 38 is popped. Heat from element 34 will rise and very little increase in temperature of the large volume of oil will occur. When the aforesaid temperature has been attained, latch 46 will be withdrawn from engagement with pin 48 because of the action of coiled thermostat strip 40 upon shaft 42. As soon as the latch is released, spring 50 will have an opportunity of exerting its force upon hopper 26 and the latter will be carried immediately to the intermediate position. As hopper 26 is so carried to that position, slide 54 that has all the while been at one end of its path of travel, will be moved toward the other end of its path of travel. As slide 54 is so moved, pin 62 will open switch 36, but the corn feed arm 74 will not be moved because of the freedom which slot 78 permits. However, when the parts are in the intermediate position, pin 76 will be at the end of slot 78, and when the operator desires to dump the popped corn into delivery chute 12, arm 74 will be pulled along to bring slide 70 into throat 66 as slide 68 is withdrawn. The parts of the machine are now in position where a coin must be inserted in order to move slide 54 back to the point of be-

ginning, and when such is done, hopper 26 will be returned to the normal position, switch 36 will be closed, and lower slide 70 will be opened to permit the introduction of a charge of corn.

But one form of the corn popping machine is exemplified by the accompanying drawings, and it is obvious to one skilled in the art that the concepts of the invention might be built into machines of widely varying characteristics.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; and a plurality of heating elements forming a bottom for the said hopper for supporting the unpopped kernels of corn.

2. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; a plurality of heating elements forming a support for the kernels of unpopped corn at the lower portion of the hopper; and means for maintaining the oil level above the heating elements when the hopper is in said position within the reservoir.

3. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; a plurality of heating elements forming a support for the kernels of unpopped corn and co-operating with the side walls of the hopper in setting off a relatively small volume of oil for submerging the kernels; and means for simultaneously moving the hopper to said position within the reservoir and connecting said heating elements with a source of current.

4. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; means for so moving the hopper; a plurality of heating elements forming a support for the kernels of corn below the surface of the popping oil when the hopper is in said position; a circuit for connecting the heating elements to a source of energy; and a switch, operable by the means for moving the hopper, for closing the circuit when the hopper is moved to said position and for opening the circuit when the hopper is moved from the said position.

5. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; manually operable means for so moving the hopper; a plurality of heating elements forming a bottom for the hopper and positioned below the normal surface of the popping oil when the hopper is in said position, said heating elements and side walls of the hopper serving to set off a relatively small amount of popping oil from that held in the reservoir; releasable means for maintaining the hopper in said position; and a thermostat within the hopper and submerged in the said small amount of popping oil when the corn is being popped, said thermostat serving to release the means for maintaining the hopper in place within the reservoir.

6. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; manually operable means for so moving the hopper; a plurality of heating elements forming a bottom for the hopper and positioned below the normal surface of the popping oil when the hopper is in

said position, said heating elements and side walls of the hopper serving to set off a relatively small amount of popping oil from that held in the reservoir; releasable means for maintaining the hopper in said position; and a thermostat within the hopper and submerged in the said small amount of popping oil when the corn is being popped, said thermostat serving to release the means for maintaining the hopper in place within the reservoir, said hopper having a spring for lifting the same out of the oil in the reservoir when the maintaining means is released by said thermostat.

7. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; manually operable means for so moving the hopper; a plurality of heating elements forming a bottom for the hopper and positioned below the normal surface of the popping oil when the hopper is in said position, said heating elements and side walls of the hopper serving to set off a relatively small amount of popping oil from that held in the reservoir; releasable means for maintaining the hopper in said position; and a thermostat within the hopper and submerged in the said small amount of popping oil when the corn is being popped, said thermostat serving to release the means for maintaining the hopper in place within the reservoir, said hopper having a spring for lifting the same out of the oil in the reservoir when the maintaining means is released by said thermostat, said manually operable means for moving the hopper being moved in one direction by said spring as the hopper is so lifted.

8. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; a coin slide in connection with the hopper for so moving the hopper; means for introducing a charge of corn to the popper in connection with the said coin slide; a plurality of heating elements forming a bottom for the hopper; a circuit for supplying energy to the heating elements; and a switch for opening and closing the circuit in connection with the coin slide whereby upon manual manipulation of the slide to move it in one direction the hopper is moved to operative position, a charge of corn is introduced into the hopper and the circuit is closed.

9. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; a plurality of spaced-apart heating elements forming a bottom for the hopper; a circuit for supplying electrical energy to the heating elements; a switch to open and close the circuit as the hopper is moved from and to a normal position within the reservoir where the said heating elements are disposed below the surface of the popping oil; and a latch for releasably holding the hopper in said normal position.

10. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; a plurality of spaced-apart heating elements forming a bottom for the hopper; a circuit for supplying electrical energy to the heating elements; a switch to open and close the circuit as the hopper is moved from and to a normal position within the reservoir where the said heating elements are disposed below the surface of the popping oil; a latch for releasably holding the hopper in said normal position; and a thermostatic strip within the hopper between the said heating elements and surface of the oil when the hopper is in the normal position, for releasing the latch when the temperature of the oil above the heating elements reaches a predetermined temperature.

11. In a corn popping machine, the combination of a reservoir for popping oil; a hopper movable to and from a position within the reservoir; a plurality of spaced-apart heating elements forming a bottom for the hopper; a circuit for supplying electrical energy to the heating elements; a switch to open and close the circuit as the hopper is moved from and to a normal position within the reservoir where the said heating elements are disposed below the surface of the popping oil; a latch for releasably holding the hopper in said normal position; and a spirally wound thermostatic strip within the hopper in connection with the latch to operate the same as the strip expands and contracts.

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