April 3, 1951 E. E. STYLL 2,547,291

POPCORN VENDING MACHINE

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Fig. 1.

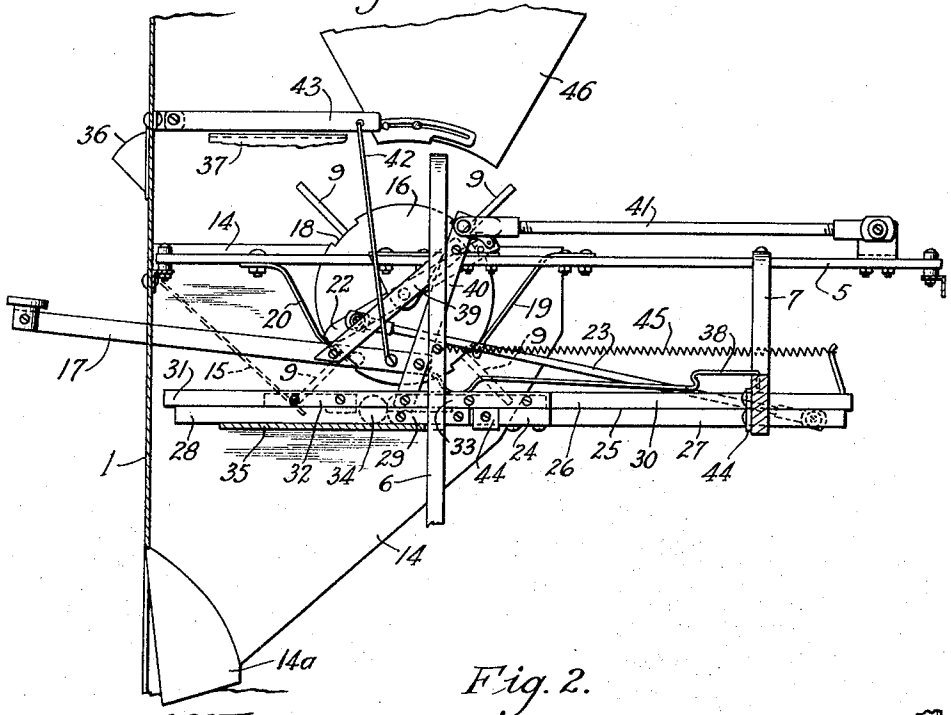
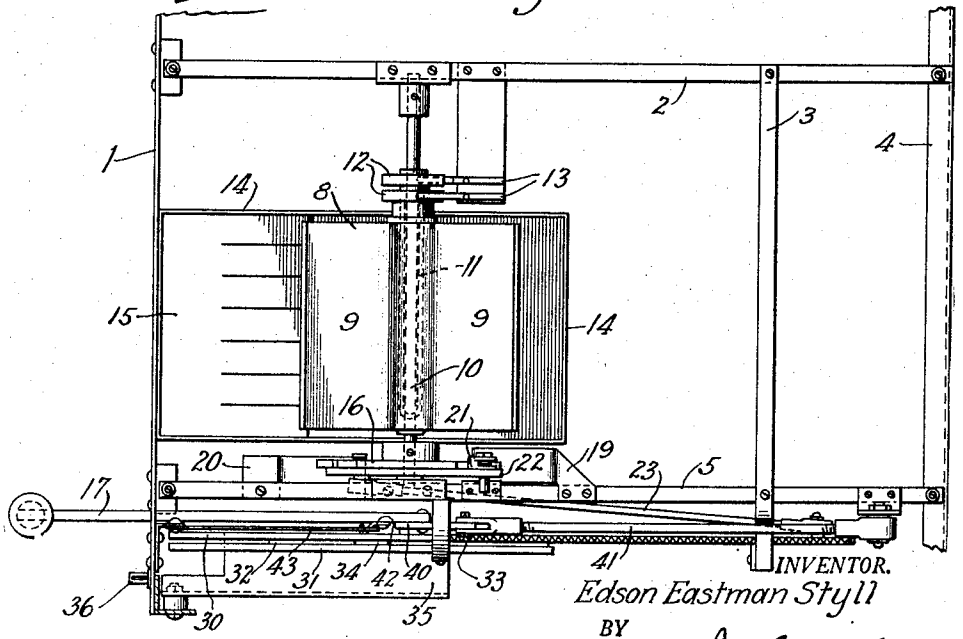


Fig. 2.



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POPCORN VENDING MACHINE

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2 Claims. (Cl. 99—238.2)

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This invention relates to an automatic popcorn vending machine which is operated mechanically by means of a hand lever and has an electrically heated measuring device.

Popcorn vending machines of the prior art which are now in popular use are electrically operated, i. e., they depend on the coin to close an electric circuit whereby an electric motor drives a vertical multi-bladed paddle wheel in a complete revolution. Some of these machines of the prior art also attempt to heat the popcorn while it is in the hopper, but such heat is relatively inefficient since the measuring device is unheated, and much of the warmth and freshness of the popcorn is lost during its passage from the hopper through the measuring device to the paper bag.

It is an object of this invention to supply an automatic popcorn vending machine which is mechanically operated by means of a hand lever in a novel manner.

It is another object of this invention to supply such a machine in which the coin when inserted in position in the machine, serves as a connecting link through which the operation of the hand lever drives the measuring device.

It is a further object of this invention to supply such a machine in which the measuring device is electrically heated and is in contact with the popcorn until it is discharged from the machine, so as to retain the popcorn at substantially its maximum temperature until the very moment of release.

Other objects of the invention will become apparent in the following description of the machine and its operation.

Referring to the drawing, Figure 1 shows a side view of the most essential portions of the machine of this invention, and Figure 2 shows a top view.

Referring to both Figures 1 and 2, panel 1 forms the front face of the machine, and horizontal braces 2 and 5 together with vertical members 6 and 7 form a rigid framework to which the various mechanisms are attached. The popcorn measuring device consists of a paddle wheel 8 revolving on a main shaft to which it is attached and having four blades 9 and a hollow hub 10 in which an electric heater 11 is enclosed. Any type of heater may be used, but the one illustrated is particularly convenient. It consists of a coil of Nichrome wire supported and insulated from the main shaft by means of an electrically insulating material such as a porcelain form and insulated from the paddle wheel by means of a sleeve of

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braided fibreglass or other suitable insulating material. The ends of the coil are connected to rings 12 with which terminals 13 make contact through spring brushes as shown. Terminals 13 are connected to a suitable source of electric power. Sufficient heat is supplied to maintain the popcorn crisp and warm without scorching it. A temperature of about 175° F. is very suitable. The paddle wheel and blades should preferably be all metal and made of some material which is a good conductor of heat, such as aluminum for example, so as to supply a fairly uniform heat over a wide area.

Paddle wheel 8 operates within funnel 14, and is fed by means of a conventional hopper 46 in which the reserve popcorn is stored. The hopper completely surrounds the paddle wheel 8 and has an adjustable lip so as to regulate the amount of popcorn falling into the front segment. A retainer 15 made in the form of a series of spring reeds fits against the blade of the wheel which is in the lower front position, so as to keep the popcorn from dropping from the front segment of the paddle wheel until the wheel is rotated. The lower part of funnel 14 is formed into a cylindrical chute 14a which fits the inside of a popcorn bag of appropriate size.

Paddle wheel 8 is rotated by means of driving wheel 16, which is connected to the same main shaft, and is so arranged that when a coin is properly inserted in the machine and operating lever 17 is depressed, the wheels 8 and 16 are rotated one quarter turn and the popcorn held in the front segment of the paddle wheel is dropped through funnel 14 directly out of the machine and into the bag or other receptacle placed around its chute as described above. The mechanism by which the driving wheel 16 is connected to operating lever 17 is described in the following paragraphs.

Driving wheel 16 has four equally spaced depressions 18 in its periphery. Spring 19 fits into one of these slots and is hooked at the end so as to prevent wheel 16 from turning backward. Spring 20 fits into another of these slots, and is so shaped as to prevent movement of wheel 16 in either direction while it is depressed. Operating ratchet 21 fits into a third one of these depressions and is shaped in the conventional form so that it will drive wheel 16 forward but not backward.

Operating ratchet 21 is attached to one end of pawl 22, which is pivotally attached to the main shaft to which wheels 8 and 16 are connected. The opposite end of pawl 22 is shaped

to form a cam, and is so positioned with respect to spring 20 that the initial movement of the pawl lifts spring 20 out of its slot and permits wheel 16 to rotate.

Pawl 22 is driven by means of connecting rod 23, which connects it to one section 24 of money bar 25. This money bar 25 will be described in more detail in the following paragraphs, but it may be explained here that it contains a coin pocket 34 and is made in two sections 24 and 26. These sections are free to move independently with respect to each other when no coin is in the coin pocket, but are driven as a unit when the coin is in the pocket in the position shown. Section 26 of money bar 25 is driven by operating lever 17 by a mechanism described below. Thus when no coin is in the pocket a depression of lever 17 drives only section 26 of the money bar, but when the coin is inserted in position as shown both sections 24 and 26 are driven by the depression of operating lever 17 and this serves to rotate paddle wheel 8 one quarter turn as described above and deliver the measured charge of preheated popcorn from the front segment of the paddle wheel through funnel 14 into the popcorn bag.

Money bar 25, as mentioned above, is composed of two horizontal sections 24 and 26. Each of these may in turn be considered as composed of three lateral sections. Thus of the horizontal sections the first or lower section 24 may be considered to be composed of bars 27 and 28 and insert 29, while the second or upper section 26 may be considered to be composed of bars 30 and 31 and inserts 32 and 33. The inserts 29, 32 and 33 are the same width as the coin, which fits in pocket 34 between them as indicated. Thus when the coin is in the position shown, insert 32 bears on one edge of the coin and insert 29 bears on the opposite edge of the coin, and thus sections 24 and 26 must move in unison. The coin rests on coin table 35 which also serves as a support and guide for money bar 25.

In the operation of the machine the coin is inserted in a slot 36 in panel 1 and passes through slug rejector 37 (indicated only in part) which discharges the coin into pocket 34 in the money bar. When operating lever 17 is depressed to the end of its stroke, the coin is driven to the right with money bar 25, until it reaches a point just beyond the extremity of coin table 35. At this point kicker spring 38 serves to knock the coin downward out of its position in the money bar into a money box, not shown.

The upper section 26 of money bar 25 is operated by operating lever 17 through lever 40 which is approximately at right angles to lever 17 and is held rigidly in position by brace 39. The lower end of lever 40 is pivotably attached directly to upper section 26 of the money bar and the upper end of lever 40 is pivotably attached to one end of radius rod 41, the other end of which is pivotably fastened to horizontal brace 5 of the framework. Lever 17 is attached to lever 40 at an intermediate point. Thus the unit composed of levers 17 and 40 together with radius rod 41 forms a free floating lever system, which provides for a straight horizontal motion of the money bar as lever 17 is depressed vertically. Lever 17 is also attached through connecting rod 42 to one end of slug rejector operating lever 43, which serves to operate slug rejector 37 as lever 17 is depressed. Spring 45 is attached to vertical member 6 of the framework and to upper section 26 of the money bar, and serves to return lever 17 to its normal or up position after it has been depressed.

The above shows the principal operating mechanism, but it is clear that there are many modifications of each part as shown, which may be employed to advantage and which are within the scope of the invention. Thus the hopper 46 which serves to load the paddle wheel 8 with popcorn may have any suitable design which will provide for the desired introduction of popcorn into contact with the paddle wheel. The hopper may also be provided with additional heating means if desired although normally the heat supplied within the paddle wheel measuring device as shown is sufficient.

The lower end of funnel 14, which forms a cylindrical chute as described above, is preferably cut in a plane at an angle with the horizontal, so that the longer portion of the lip is at the front as shown. This facilitates the insertion of the chute into the popcorn bag. Preferably also the chute is placed within an alcove or recessed portion of the front panel 1, and an open horizontal grille is placed at such a distance below the chute that the bag may be placed around the chute and rest on the grille. The grille is made of sufficiently large mesh to allow the popcorn to pass through it readily. Thus in the event that some of the popcorn is accidentally spilled, it may pass through the grille into a waste receptacle placed under the grille.

The position of spring 20 is somewhat critical so that it is desirable to make this position adjustable. This may be done by employing two screws to fasten the spring to the framework, and making the holes through which the screws pass in the form of slots which are elongated in one direction for the spring, and elongated in a right angle direction for the support. Similarly the position of the coin table 35 should be adjustable to enable one to place the mechanism in proper horizontal alignment.

Rubber pads 44 may be employed to cushion the money bar 25 at each end of its stroke. Also insert 32 in the money bar may have a projection along its underside which fits into a recess in insert 29, and the recess in insert 29 may be discontinued near its right end as indicated, so as to form a stop or an engagement between sections 26 and 24 at any desired point when the coin is not in the position shown. Also the positions of each member of the mechanism may be made slightly adjustable in order to compensate for any slight inaccuracies in the machine parts and make the equipment run more smoothly. It may also be desirable to employ a spring operated toggle placed in such a position as to aid the movement of money bar 25 near each end of its stroke, so as to provide for a more definite return action of the money bar and a more ready release of the coin at the right end of the stroke, i. e., at the lower extremity of the movement of lever 17. The slug rejector 37 may be a conventional slug rejector such as that manufactured by the National Slug Rejector Company of St. Louis, Missouri. By suitable modifications which are readily apparent, it is also clear that the paddle wheel 8 may be made vertical rather than horizontal.

The entire popcorn vending machine may include a cabinet within which the operating mechanism shown in the drawing may be mounted, and also means for loading the hopper above the operating mechanism, hinged or removable top, access doors where needed, as well as ornamental

lighting, receptacles for the bags, coin return cup and other equipment as desired. The primary features of the present invention however, comprise the electrically heated measuring device, the design of the money bar, and the mechanical method of operating the measuring device.

Other modifications of the invention which would occur to one skilled in the art may be made, and these are to be considered a part of the invention as defined in the following claims.

I claim:

1. A popcorn vending machine which comprises a horizontal multi-bladed paddle wheel measuring device having a hollow hub containing an electric heater, a driving wheel connected thereto and having a depression in its periphery for each blade of the paddle wheel, a spring adapted to fit in one of said depressions so as to prevent forward or backward rotation of said driving wheel while said spring is depressed, a pawl pivotably attached to the shaft passing through the hub of said driving wheel, said pawl having an operating ratchet at one end adapted to fit into another of said depressions on said driving wheel and rotate said driving wheel forward and having the form of a cam at the other end adapted to lift said spring from its depression so as to permit said forward rotation of the driving wheel, means for driving said pawl so as to rotate said driving wheel to the next depression in its periphery, hopper means above said paddle wheel to fill an upper segment of said paddle wheel between two of said blades with popcorn, and funnel means below said paddle wheel to receive popcorn discharged from a lower segment of said paddle wheel by the rotation of the driving wheel.

2. A popcorn vending machine which comprises a 4-bladed horizontal paddle wheel measuring device having a hollow hub containing an electric heater, means for introducing popcorn into said measuring device, said means comprising a hopper with an adjustable lip, means for retaining the popcorn in contact with a heated portion of said measuring device, said means comprising a multi-fingered flexible retaining element, means for discharging the heated popcorn directly from said measuring device out of said machine through a funnel having a cylindrical chute with a longer lip at the front thereof, a driving wheel connected to the same shaft as said paddle wheel said driving wheel having four equidistant depressions in its periphery, a hooked spring adapted to fit into one of said depressions so as to prevent backward rotation of said driving wheel, a second spring adapted to fit into another of said depressions so as to prevent forward or backward rotation of said driving wheel while said spring is depressed, a rest arm pivotly attached to the shaft of said driving wheel, said rest arm having an operating rest at one end adapted to fit into another of said depressions on said driving wheel so as to rotate said driving wheel forward, a one quarter turn on each stroke and the other end of said rest arm being in the form of a cam adapted to lift said second spring from its depression so as to permit said forward rotation of the driving wheel, a horizontal money bar containing a coin pocket and composed of two sections, said sections being capable of independent movement with respect to each other when no coin is in said pocket but being driven as a unit when a coin is in said pocket, a connecting rod connecting the lower section of said money bar to said rest arm, a vertically moving operating lever attached to the upper section of said money bar through a free floating lever system so as to cause horizontal operation of the latter, means for introducing a coin into said machine into said coin pocket of said money bar at one end of its stroke, and means for discharging said coin from said pocket at the other end of its stroke.

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