July 21, 1953 A. W. WICKESBERG 2,646,189

MELTING AND DISPENSING APPARATUS

Filed April 11, 1949 2 Sheets-Sheet 1

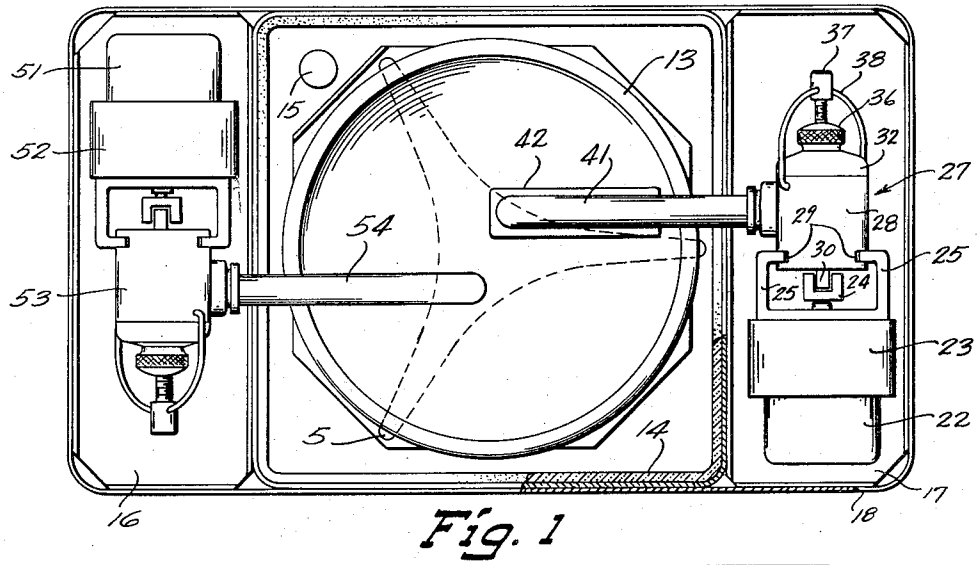


Fig. 1

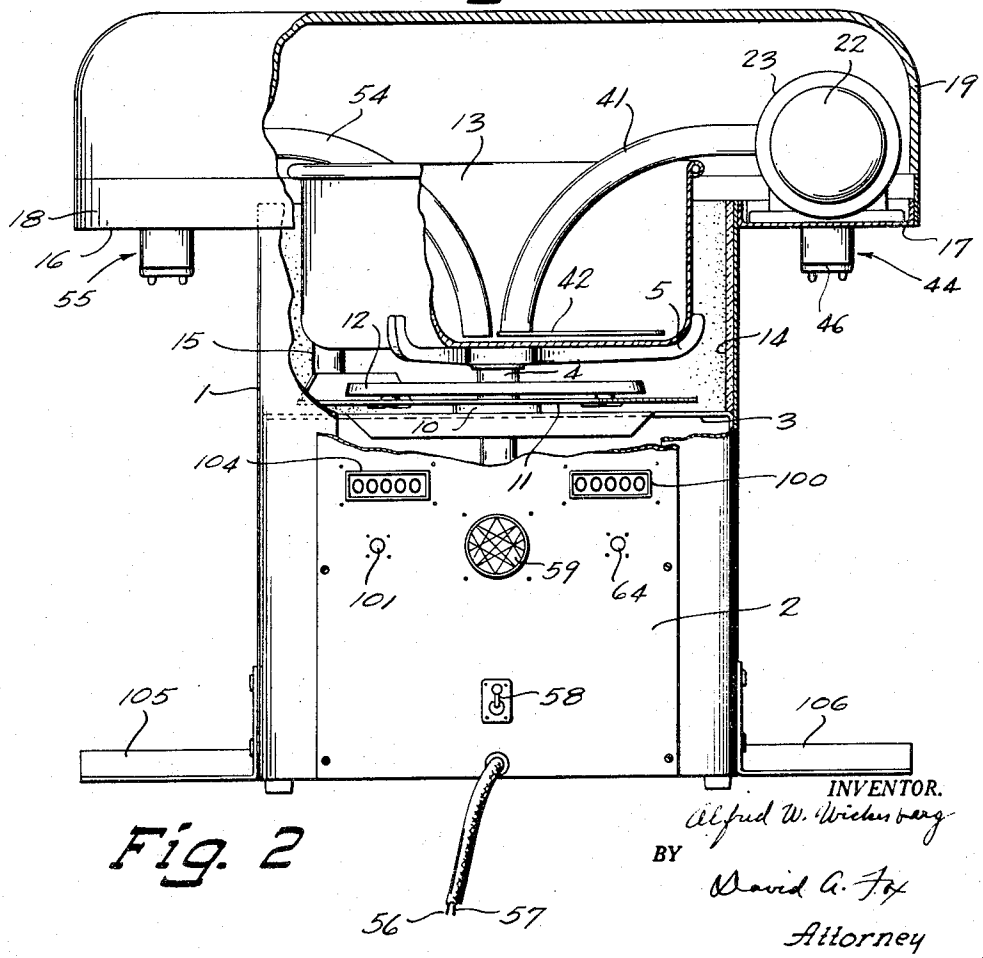


Fig. 2

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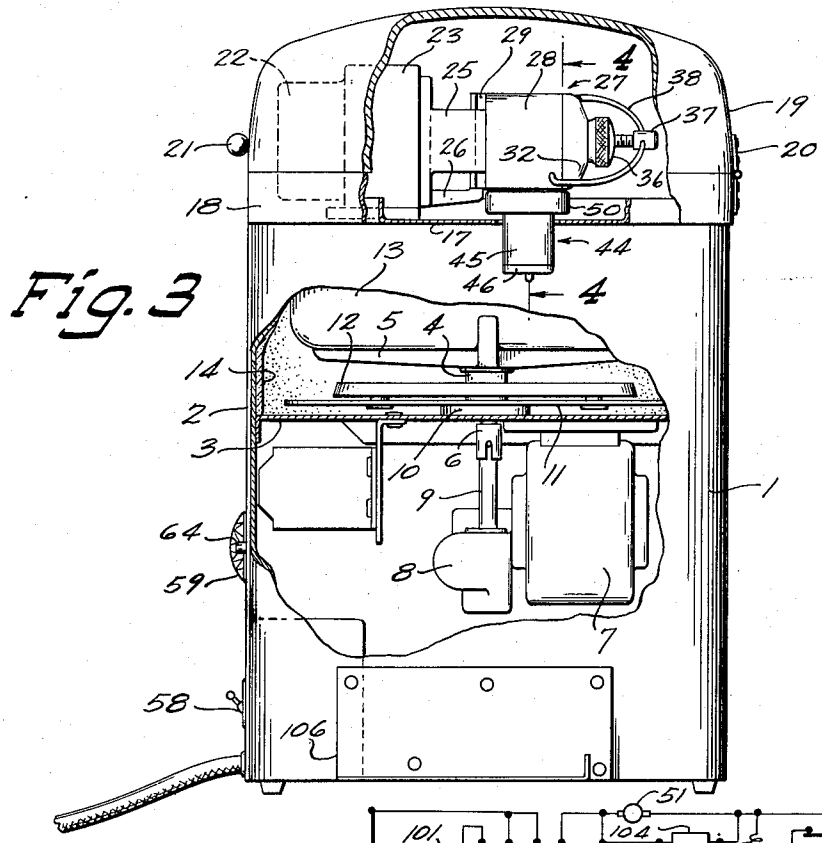


Fig. 3

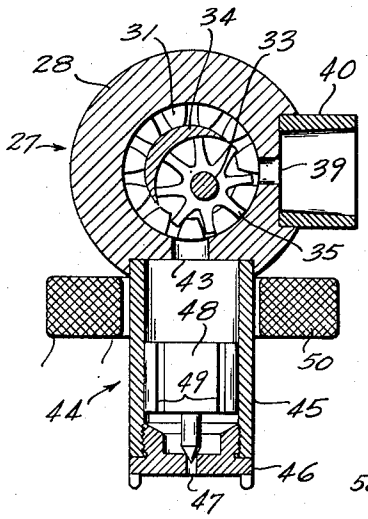


Fig. 4

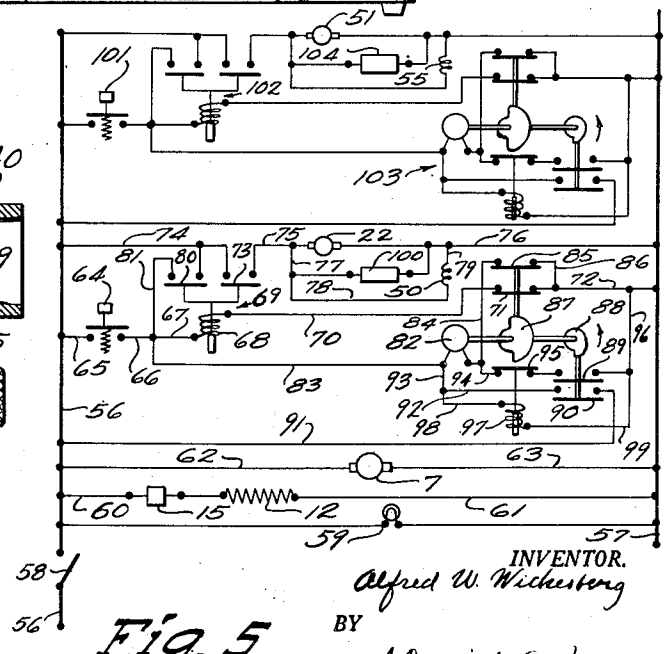


Fig. 5

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MELTING AND DISPENSING APPARATUS

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10 Claims. (Cl. 222—36)

1

This invention relates to dispensing apparatus adapted to deliver measured quantities of flowable material, including fluid formed from meltable solids, and it resides more particularly in a novel and improved form of such apparatus capable of melting solids to a fluid state and of delivering and recording the delivery of predetermined quantities of such fluid, the apparatus being readily accessible to permit full sanitary cleansing thus rendering the apparatus suitable for the dispensing of molten edible fats such as butter.

An object of this invention is to provide an apparatus which will melt, and hold molten without undesirable segregation a supply of butter or other edible meltable material, which is to be dispensed in smaller quantities from time to time.

Another object of this invention is to provide an apparatus which will positively dispense fluid in predetermined quantity not subject to variation by the operator.

Another object of this invention is to provide a positive fluid dispensing apparatus all parts of which, in contact with the fluid, can be subjected to cleansing for sanitary purposes.

Another object of this invention is to provide an apparatus suitable for melting and dispensing butter in molten form to facilitate the retailing of buttered popcorn, which will ensure the customer of full and accurate measure, which will be sanitary and which will record the total quantity sold to permit supervision of the retail operation.

Another object of this invention is to provide a meltable solids dispenser in which molten condition of the material dispensed is maintained at all times throughout the melting and dispensing parts of the apparatus.

The above and other objects and advantages of this invention will be made to appear in the description following, which is set forth with reference made to the accompanying drawings, forming a part hereof, and in which there is shown by way of illustration and not of limitation one form in which the apparatus of this invention may be embodied.

In the drawings:

Fig. 1 is a top plan view with parts broken away and in section of one form of the apparatus of this invention shown with the cover removed;

Fig. 2 is a front view in elevation with parts broken away and in section of the apparatus appearing in Fig. 1;

Fig. 3 is a side view in elevation with parts broken away and in section of the apparatus appearing in Fig. 1;

Fig. 4 is a detailed view in rear elevation and

2

in section viewed through the plane 4—4 indicated in Fig. 3; and

Fig. 5 is a circuit diagram of the electrical circuit employed in the apparatus shown in the other figures.

The form of the apparatus of this invention shown in the drawings as appears more clearly in Figs. 1, 2 and 3 is provided with a main supporting housing 1 closed at the front by an operating panel 2. Within the housing 1 and secured thereto in horizontal position is a supporting shelf 3 which provides support for a melting assembly described hereinafter in greater detail.

Centrally mounted in the shelf 3 with its axis vertically disposed is a bearing 4 within which is rotatably mounted a shaft which is secured to a melting bowl supporting spider 5. As appears more clearly in Fig. 1 the spider 5 is made up of three arms equally spaced angularly with respect to the shaft. The shaft which is secured to the spider 5 extends downwardly through the bearing 4 and the shelf 3 to a coupling 6. Mounted beneath the shelf as shown in Fig. 3 is a melting bowl driving motor 7 having reduction gear 8 and an upwardly facing output shaft 9 which is drivingly connected to the coupling 6. When the motor 7 is operated the spider 5 is caused to rotate slowly.

Mounted a short distance above the shelf 3 in parallel relationship thereto and carried upon a central supporting collar 10 is a heat deflecting baffle plate 11 which serves as a support for an annular electrical resistance heater 12. Disposed above the heater 12 in heat receiving relationship thereto and carried upon the spider 5 is a rotatable melting pan 13. The interior of housing 1 is lined with a layer of heat insulating material 14 to conserve the heat emitted by the heater 12. Located within the housing 1 adjacent to pan 13 is a thermostatic electric switch 15 so located as to respond to the environmental temperature of housing 1 and to heat radiated by the pan 13.

Extending laterally from the housing 1 near the top of the same are pump supporting shelves 16 and 17. The shelves 16 and 17 are rigidly attached to the housing 1 and are re-enforced by a continuous vertical flange 18 surrounding the shelves 16 and 17 and the housing 1 as shown. The top of the housng 1 and the shelves 16 and 17 are closed by a recessed cover 19 secured in place by hinges one of which designated by the numeral 20 appears in Fig. 3. A handle 21 attached to the cover 19 assists in raising the cover when access to the interior is desired. Mounted upon shelf 17 is a dispensing pump driving motor 22 having a combined output reduction gear and timer mechanism 23 secured thereto. Projecting

laterally from the reduction gear 23 is an output shaft having a slotted driving coupling mounted thereon. Also secured to the reduction gear 23 and extending in the direction of the output shaft is a pair of inwardly facing mounting lugs 25—25. Beneath the lugs 25—25 projecting from the reduction gear 23 is a pump supporting arm 26. Detachably held in place by the lugs 25—25 and the supporting arm 26 is a dispensing pump designated generally by the numeral 27 having a pump body 28 provided with vertical slots or mounting ways 29—29 arranged to slidingly engage the inner ends of the lugs 25—25. The dispensing pump is provided with an input shaft having a flattened end 30 arranged to be received within the slot in coupling 24 when the latter is oriented in vertical position. The pump body 28 of the dispensing pump and its associated parts may be lowered into the position shown in the drawings and thus brought into driven relationship with the motor 22. Whenever desired the dispensing pump 27 may be removed by simply raising it after first vertically orienting the slot in coupling 24.

Pump 27 may be of the positive displacement type but any pump, preferably of the rotary type may be employed, the form thereof shown in the drawing being of the well known internal, external gear type. As appears in greater detail in Fig. 4 the pump body 28 contains an axially disposed cylindrical chamber within which there is rotatably mounted in close fitting relationship an internal gear 31 secured to the pump input shaft. The cylindrical chamber within the pump body 28 is closed by a head 32 from which there projects inwardly an internal pinion journal pin 33 and a crescent shaped space occupying member 34. Mounted for rotation upon the journal pin 33 is an external pinion 35 which completes the pump assembly. Head 32 is quickly detachable and is held in place by nut 36 carried on swing bolt 37 mounted in turn upon the bail 38.

The entire pump 27 may be completely disassembled without resort to tools by simply backing off the nut 36 and removing the head 32. Pinion 35 separates readily from the head assembly and the pump input shaft and the gear 31 which are preferably formed integral may be withdrawn from the pump body 28.

The pump 27 as appears in greater detail in Fig. 4 is provided with an inlet opening 39 surrounded by an inwardly tapering boss 40. Mounted in closely fitting engagement with the boss 40 is a curved suction pipe 41 which extends to a point close to the bottom of pan 13. Secured to the lower end of suction pipe 41 is an agitating blade 42 which is spaced but a short distance from the bottom of the pan 13.

Also shown more clearly in Fig. 4, pump 27 is provided with a discharge opening 43 which is joined by a solenoid valve assembly generally designated 44. The solenoid valve assembly 44 is made up of a non-magnetic body of cylindrical form closed at its lower end by a removable valve seat 46 having a centrally disposed discharged opening 47. Mounted for vertical sliding movement within the body 45 is a combined magnetic armature and valve stem 48. The armature 48 is grooved vertically as at 49 to allow free vertical passage of fluid. Mounted at the upper end of the valve body 45 and surrounding the same is a toroidal electrical winding 50. When the winding 50 is energized armature 48 with its associated valve stem is magnetically raised thus opening the discharge passage 47. Upon de-energization of winding 50 armature 48 and its associated valve stem drop closing discharge opening 47.

On the left hand side of the apparatus mounted upon shelf 16 is a motor 51 reduction gear and timing mechanism 52 pump 53 suction pipe 54 and discharge valve 55 corresponding in all respects to the motor 22 reduction gear and timing mechanism 23 pump 27 suction pipe 42 and discharge valve 44. The lower end of suction pipe 54 however is not provided with a baffle blade such as would corresponding with blade 42 since a single blade of this nature is sufficient for the purposes required.

While the apparatus above described is adapted for dispensing heated fluids of various sorts the specific use for which the same is well adapted is the supplying of melted butter in connection with the retail sale of popcorn. For this purpose an electrical control circuit not shown in Figs. 1–4 inclusive but displayed in detail in Fig. 5 is employed to provide for the melting and dispensing of butter in measured quantities.

In the control circuit shown in Fig. 5 electric power supply leads 56 and 57 are connected through switch 58 first to pilot lamp 59 which advises that the circuit is energized. Connected permanently to lead 56 by lead 60 and thermostat 15 is the heater element 12 which is joined in turn by lead 61 with lead 57. In similar fashion pan rotating motor 7 is joined by leads 62 and 63 with leads 56 and 57 respectively. Upon closure of switch 58 pan 13 is caused to rotate while heat is supplied thereto by the heater 12 under the regulation of thermostat 15. The operator may then raise the lid 19 and place in the pan 13 butter or other solids to be melted. As operation continues pan 13 rotating the contents thereof against the baffle 42 quickly reduces the solid contained to molten form at the same time gently stirring the resulting fluid to deter segregation of its constituents.

In order to cause liquid to be withdrawn from the pan 13 and to be dispensed through the right hand valve 44 a push button 64 is provided. Push button 64 serves when closed to complete a circuit extending from lead 56 and lead 65 through lead 66 and lead 67 to the winding 68 of the magnetic contactor switch designated generally 69. Winding 68 is connected in turn through lead 70 timer controlled contacts 71 and lead 72 back to power supply lead 57. Winding 68 being thus energized causes switch 69 to close closing contacts 73. The closing of contacts 73 establishes a circuit extending from lead 56 through lead 74 and lead 75 to motor 22. Motor 22 is joined in turn by means of lead 76 to power lead 57. In this way motor 22 is energized causing pump 27 to draw fluid from the pan 13 and discharge the same through valve 44. In order to permit such discharge to take place valve winding 50 is joined by means of leads 77, 78 and 79 in shunt relationship to the motor 22 so as to be energized simultaneously therewith.

Closure of switch 69 simultaneously causes maintaining contacts 80 to be closed which through lead 74 and lead 81 act to provide a maintaining circuit for the winding 68 when the operator releases the push button 64. This causes the motor 22 the pump 27 and the valve 44 to continue in operation. For the purpose of causing termination of the running period of the motor 22 at the end of a predetermined interval timing mechanism is provided.

Enclosed within the reduction gear and timing mechanism 23 and not otherwise shown than in Fig. 5 is a timing mechanism of well known form comprising a motor 82 which is joined by the lead 83 and the lead 66 with push button 64. Upon closure of the push button 64 there is established and by closure of the switch 69 there is maintained a supply of current to the motor 82 which finds a return connection to the line 57 through the lead 84 contacts 85 lead 86 and lead 72. Upon closure of the push button 64 motor 82 therefore starts to run driving cam 87 in the direction shown. At the same time cam 88 is similarly driven causing limit contacts 89 and 90 to close for purposes to be presently explained. Motors 22 and 82 therefore continue to run after closure of push button 64 until cam 87 reaches the position at which contact 71 is opened. The opening of contact 71 interrupts control current in coil 68 causing switch 69 to drop open. This immediately closes the valve 44 and terminates the running of motor 22. Motor 82 however continues to run by reason of power supplied thereto from lead 56 through lead 91 contact 90 lead 92 and lead 93 and by reason of the return connection extending from motor 82 through lead 94 contact 95 contact 89 lead 96 and lead 72 which joins with supply lead 57. Motor 82 thus continues to run until cam 88 attains the position shown in Fig. 5 whereupon contacts 89 and 90 open to terminate the running of motor 82. At the same time cam 87 is brought to the position shown in Fig. 5 thus preparing the circuit for the performance of a new cycle.

In order to prevent repeated cycling of the circuit due to accidental or deliberate jamming of button 64 in closed position the normally closed contact 95 is provided. Contact 95 is magnetically controlled by the winding 97 which acts when energized to open said contact 95. If the operator closes button 64 and holds the same in closed position arrival of the cam 87 at the end of the raised portion thereof will not only terminate running of motor 22 but will interrupt the only return path provided for winding 68 and hence will render impossible further running of motor 82 intended to run to the termination of a complete cycle by the action of limit contacts 89 and 90. This action occurs by reason of a circuit established from lead 56 through lead 65 button 64 lead 66 lead 83 lead 93 lead 98 winding 97 lead 99 lead 96 and lead 72 which joins with supply lead 57. In this way the timing cycle is brought to a stop and cannot be reinitiated unless the button 64 is first released. The interruption interposed in this fashion prevents the operator from producing unattended repeated discharges by jamming the button 64 with a pin or sliver in continuously depressed position.

For the purpose of recording the number of individual quantities of fluids dispensed there is placed in shunt relationship with motor 22 a counter 100 connected as shown. The counter 100 is preferably mounted in the panel 2 in an easily observed position and may be of well known form such as to respond to the electrical impulse delivered thereto when motor 22 is energized.

Motor 51 and pump 53 are similarly controlled by an identical circuit including a push button 101 switch 102 and timer mechanism generally designated 103. Acting in conjunction with the motor 51 is a counter 104 corresponding with the counter 100.

Since an object of this invention is the dispensing of edible products complete sanitary maintenance is necessary. As explained above pumps 27 and 53 may be completely disassembled for cleansing. At the same time suction pipes 41 and 54 may be quickly removed and valves 44 and 55 may be completely disassembled. These parts together with the pan 13 and all of the pump parts can be immersed in sterilizing baths without harm. Since these parts are the only parts which come into contact with the material to be dispensed complete sanitary maintenance is rendered convenient and practical.

The apparatus of this invention above described is of particular use and advantage in dispensing heated fluids which solidify upon cooling since the melting apparatus and the dispensing parts except for a small portion of the dispensing valves themselves are all housed within a heated enclosure and thus maintained above the melting point of the material being dispensed. The small portions of the discharge valves 44 and 55 which extend from the heated housing are however effectively maintained at a safe temperature by conduction from the comparatively massive parts of the pump. To add to the convenience in dispensing, small shelves 105 and 106 may be attached to the housing 1 as shown.

I claim:

1. In a dispensing apparatus for meltable solids the combination comprising a heat retaining housing comprising a bottom surrounded by vertically extending walls, an overhanging shelf extending laterally from said vertical walls at one side thereof near the top thereof and a removable cover extending across and covering the upper opening of said vertical walls and said laterally extending shelf; heating means on the bottom of said housing; a removable melting pan within said housing above said heating means; and fluid discharging means including pump means mounted on said laterally extending shelf, an inlet pipe extending therefrom into said melting pan, and a discharge conduit extending from said pump downwardly through said laterally extending shelf to the exterior of said housing, said inlet pipe, pump and a substantial portion of said discharge conduit being included within said housing and exposed to heat admitted by said heating means to prevent solidification of meltable solids contained therein.

2. An apparatus in accordance with claim 1 in which the pan is mounted for rotation about a vertical axis and in which there is included driving means drivingly connected to said pan to rotate the same.

3. An apparatus in accordance with claim 1 in which the pan is mounted for rotation about a vertical axis and in which there is included driving means drivingly connected to said pan to rotate the same and in which stationary stirring baffle means are mounted within said pan close to the interior surface thereof.

4. An apparatus in accordance with claim 1 in which the pan is mounted for rotation about a vertical axis and in which there is included driving means drivingly connected to said pan to rotate the same and in which a stationary stirring baffle is mounted on the inlet pipe within said pan close to the interior surface thereof.

5. In a dispensing apparatus for edible, meltable material the combination comprising a heat retaining housing having an overhanging lateral extension in the upper part thereof, a heating source for maintaining the interior of said housing at a temperature above the melting point of

the material to be dispensed, a melting vessel in said housing for holding the material to be dispensed, delivery means for transferring the melted material from said vessel to the exterior of said housing including a pump detachably mounted on the lateral extension of said housing adjacent said vessel, an inlet pipe carried by said pump extending into said vessel, and a discharge conduit extending from said pump downwardly to the exterior of said housing, an electro-magnetically actuated valve in said discharge conduit, and an electric supply circuit connected to said motor and to said valve to cause simultaneous driving of said motor and opening of said valve.

6. An apparatus in accordance with claim 5 in which said electrical circuit includes timing means operative to discontinue running of said motor and simultaneously to cause closure of said valve at the end of a predetermined interval.

7. An apparatus in accordance with claim 5 in which said electrical circuit includes timing means operative to discontinue running of said motor and simultaneously to cause closure of said valve at the end of a predetermined interval and an electrically actuated recording counter connected to execute an integer change each time running of said motor takes place.

8. In a dispensing apparatus for edible, meltable material the combination comprising a heat retaining housing, a heat source for maintaining the temperature of the interior of said housing above the melting point of the material to be dispensed, a vessel in said housing for holding material to be dispensed, delivery means in said housing for transferring the material from said vessel to the exterior of said housing including a pump detachably mounted adjacent said vessel, an inlet pipe carried by said pump extending to a point within said vessel, a discharge conduit extending from said pump to the exterior of said housing, fluid restricting means disposed in said discharge conduit adapted to restrict flow therethrough when said pump is stopped, an electric motor drivingly connected to said pump, and an electric supply circuit for said motor including a power source normally electromagnetically actuated switch connecting said source to said motor, a control circuit including a starting button for closing said switch, auxiliary contacts on said switch connected to said source to provide a maintaining circuit to hold said switch closed after said starting button is released, a timer switch motor having a predetermined cycle of operation rendered operative by closure of said starter button, contacts in said switch maintaining circuit opened after a predetermined interval by said timer switch motor to cause opening of said maintaining circuit of said electromagnetically actuated switch and to render said starting button inoperative to re-close the same prior to completion of said timer switch motor cycle, a cycle completing circuit for said timer motor rendered active to complete the cycle of operation of said timer motor upon opening of said electromagnetically actuated switch, and a cycle stopping circuit rendered operative to prevent completion of said timer motor cycle upon closure of said starting button at any time after said electromagnetically actuated switch has opened prior to completion of said timer motor cycle.

9. In a dispensing apparatus for edible, meltable material the combination comprising a heat retaining housing having an overhanging lateral extension in the upper part thereof, a heating source for maintaining the interior of said housing at a temperature above the melting point of the material to be dispensed, a melting vessel in said housing for holding the material to be dispensed, delivery means for transferring the melted material from said vessel to the exterior of said housing including a pump detachably mounted on the lateral extension of said housing adjacent said vessel, an inlet pipe carried by said pump extending into said vessel, and a discharge conduit extending from said pump downwardly to the exterior of said housing, an electric motor drivingly connected to said pump, and valve means in said discharge conduit opened in response to power delivered to said motor.

10. In a dispensing apparatus for edible, meltable material the combination comprising a heat retaining housing, a heat source for maintaining the temperature of the interior of said housing above the melting point of the material to be dispensed, a vessel in said housing for holding material to be dispensed, delivery means in said housing for transferring the material from said vessel to the exterior of said housing including an inlet pipe extending into said vessel, a discharge pipe extending from within said housing to the exterior of said vessel and a pump interposed between said inlet and discharge pipe in fluid transferring relation thereto said pump having a body provided with substantially vertical mounting ways, an input shaft entering said body at a point between the run of said ways, a motor having an output shaft and mounting lugs secured thereto spaced for interfitting vertical sliding engagement with the ways on said pump body to support and maintain the same against rotation and endwise displacement, vertical stop means secured to said motor positioned to maintain said pump body against downward movement at a level in which said motor output shaft and said pump input shaft are in substantial alignment, and coupling means mounted upon said shafts adapted to be engaged and disengaged by transverse vertical sliding movement when said shafts are oriented in predetermined position, and an electric supply circuit connected to said motor to cause driving of the same.

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