

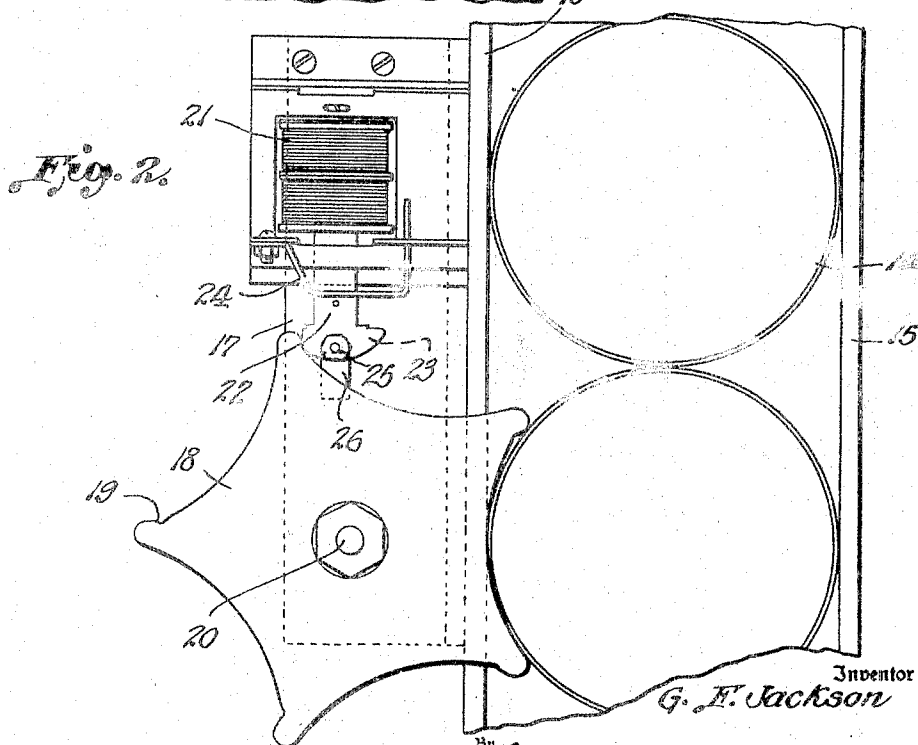
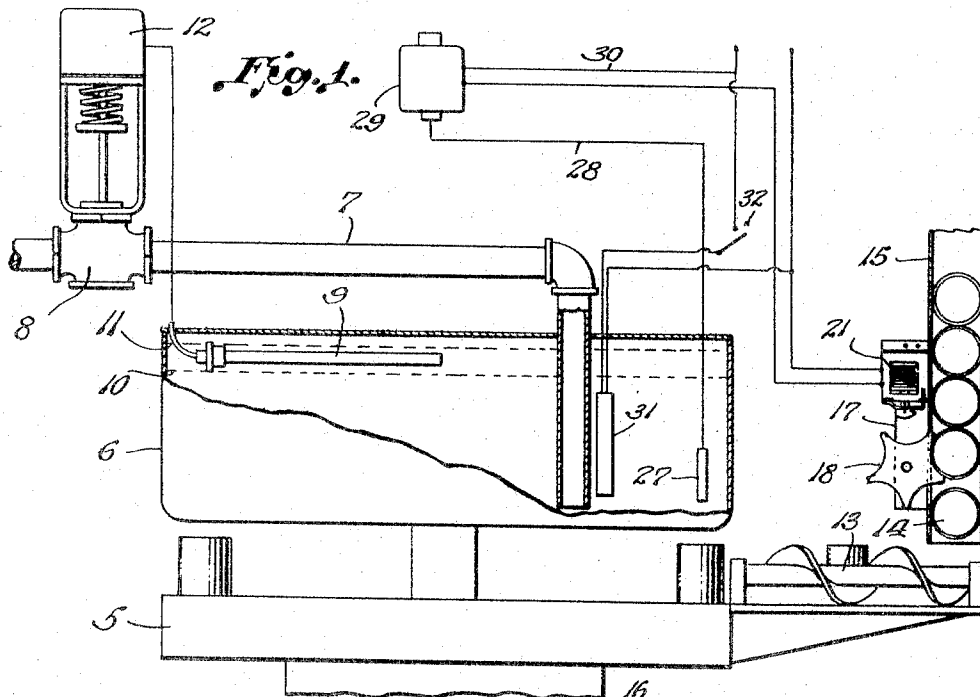
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TEMPERATURE CONTROL FOR FEEDING CANS

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TEMPERATURE CONTROL FOR FEEDING CANS

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The following description relates to an improvement in temperature control for feeding cans to a liquid filling machine.

It is primarily designed to be used in conjunction with a machine for filling cans with fruit juices, or the like, and then sealing the cans. These operations are generally carried out dependent upon the fluid being supplied to the cans at a desired degree of heat. It is important to interrupt the filling operation in the event the fluid cools and when that occurs it is essential to arrest the feed of the empty cans to the filling machine, so that cans will not be filled and sealed at a temperature below that required to properly preserve the contents of the sealed can.

An object of my invention is to provide simple and effective means to check the feed of empty cans to the filling machine as soon as the liquid in the latter cools below the normal temperature.

A further object of my invention is to carry out the above purpose without stopping the operation of filling those cans which have already been delivered to the turret of the filling machine.

A still further object of my invention is to effect the stoppage of the can feed when the liquid in the bowl of the filling machine is depleted.

Other objects of the invention will be apparent from the following detailed description.

In many instances, filling machines are designed to be stopped whenever conditions in the bowl make this desirable. Such conditions may be depletion of the supply or its cooling. When the filling machine is then stopped, there are of course a number of filled or partially filled cans on the filler turret and ahead of the sealing machine. It is obvious that if these cans were allowed to stand, the contents would cool and if subsequently sealed at a temperature lower than normal, the product would spoil. Under the aforementioned condition, it has been the practice for the operator to remove the filled cans and return their contents to the filler bowl or if these cooled cans have inadvertently been sealed, the operator removes the sealed cans from the line so they will not pass into storage with other cans which were sealed at the proper temperature. It frequently happens that the operator cannot distinguish these cans from those that have been filled and sealed at proper temperature.

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My invention is designed to avoid such a situation. I have arranged to check the supply of the empty cans without, however, interfering with the completion of filling those cans which have reached the turret of the filling machine.

In order to illustrate the invention, I have shown the preferred form on the accompanying drawings in which:

Fig. 1 is a diagrammatic view partly in vertical section of the improved temperature control as used with a filling machine and its associated can feed, and

Fig. 2 is a view in elevation, somewhat enlarged, of the can stop mechanism itself.

The stop mechanism is shown as employed in connection with a machine for filling and closing cans. The empty cans are fed into a chute which discharges the cans one after another, onto a timing mechanism which delivers the cans to the filling machine in spaced relation to each other. This timing mechanism is so constructed that it receives the cans from the chute in horizontal position and turns the cans as they are delivered to the filling machine into a vertical position ready to be filled. In this way the cans are presented below the bowl of the filling machine and are in position to receive measured quantities of liquid from the bowl in the usual manner.

The general arrangement of the can chute and means for controlling the delivery of the cans by reference to a low level condition in the bowl of the filling machine is shown in the Ayars patent granted November 14, 1944, No. 2,362,792.

In my present arrangement the stoppage of the can feed is controlled directly from a drop in temperature in the bowl of the filling machine. This drop in temperature may be due to the cooling of the liquid in the bowl. It may also occur when the level of the liquid goes below a desired minimum. Related to this is a provision by which the supply of heated liquid to the bowl is maintained normal. Departure from the normal rate of supply itself may thus be the cause for arresting the feed of cans from the chute.

I have illustrated a filling machine turret 5 which is the customary bowl 6 to hold the hot liquid during the operation of filling a series of empty cans.

The hot liquid is supplied through feed pipe 7 and this, in turn, is controlled by a valve 8.

A temperature responsive element 9 is sup-

ported in the upper part of the bowl 6 at a desired level. The element 9 is intended to be placed above the low level 10 of liquid and below the normal high level 11 as indicated by the dotted lines.

The temperature responsive element may, for example, be a thermostat operating through an expansive fluid.

Valve actuating means 12 is provided in association with the valve 8 and is controlled from the thermostat 9. The operation is such that the valve is normally closed. This condition exists when the element 9 is subject to the surrounding or proximate heated liquid in the bowl 6. This would normally be represented by the high level 11. If, however, the liquid falls to the level 10 below the element 9, valve 8 is opened and added heated liquid is supplied until the element 9 is submerged and the valve closed.

The supply of empty cans to the turret 5 is provided by a combined conveyor and righting device 13 similar to that shown in the above Ayars patent. The device 13 receives cans 14 singly from the bottom of a vertical chute 15. One wall 16 of the chute 15 is vertically slotted to provide a passageway for a movable stop means.

The side wall 16 has a bracket 17 on which the stop mechanism is mounted. The stop mechanism comprises a star wheel 18 of thin metal plate having a recessed periphery corresponding to the curvature of the cans to be fed. The star wheel 18 may be replaced by another of similar design but different size when the size of the can is varied. The curvature of the star wheel is notched at 19 for engagement with a latch.

The star wheel is mounted for free rotation upon a fixed shaft 20 extending horizontally from the bracket 17.

Above the star wheel 18, bracket 17 carries a solenoid 21. This solenoid has a center plunger or armature 22 which forms a drop latch. The head 23 of the plunger is enlarged and has a vertical face to engage the notches 19 of the star wheel.

The plunger 22 is drawn up by the energized solenoid until it rests against the usual limit stop 24.

When the head 23 drops by gravity into a position opposite a notch 19 of the star wheel, it is supported by means of a transverse pin 25 which it carries and which contacts a fixed rest 26 extending out from the bracket.

A second temperature responsive element 27 is suspended near the bottom of the bowl 6 subject to the temperature of the liquid. This element is also preferably operated by expansive fluid. This fluid is delivered through an appropriate fine tube 28 to a pressure-operated electric switch 29. Switch 29 is in an electric circuit 30 connected to a source of electricity, preferably alternating current. The circuit 30 also includes the winding of the solenoid 21. During normal operation, the element 27, due to the maintenance of normal temperature in the bowl 6 keeps the switch 29 closed and the plunger 22 retracted in the solenoid 21. Under such conditions, the cans 14 drop in succession through the chute 15 and through the righting means 13 where they are successively up-ended and delivered to the turret 5 for filling. The star wheel 18 rotates freely with the cans as they fall through the chute.

When, however, an abnormal condition of temperature develops in the bowl 6, the element 27 responds to the fall in temperature and opens switch 29. Deenergization of the solenoid 21

allows the plunger latch to drop until pin 25 is stopped by rest 26. In this position as shown in Fig. 2, the head 23 of the plunger 22 engages notch 19 in the star wheel and prevents the latter from free rotation. The star wheel then acts as a stop for can 14.

The supply of cans, therefore, is arrested so long as the abnormal temperature condition remains.

In the meantime, any cans on the turret 5, or being advanced by the means 13, can be filled, sealed and disposed of. It will thus be apparent that arresting the flow of cans does not interfere with the completion of the filling and sealing of the cans with the liquid therein at the desired temperature.

The sole purpose of element 9 is to maintain the level of the liquid in the bowl within desired limits. The element 9 is selected so as to be responsive to temperatures approximately 40° to 50° lower than the normal temperature in the bowl. Therefore, the valve 8 will close when the level 11 is reached, even though the temperature of the liquid in the bowl is below the normal temperature, thus preventing the overflow of the bowl when this low temperature would cause the element 27 to operate and cut off the flow of cans to the filler. The temperature of the liquid under these conditions is then brought up to normal again by manually closing a switch 32 in a circuit including a heating element 31 immersed in the bowl.

From the above description it will be manifest that simple and effective means have been provided for momentarily arresting the feed of empty cans to a filling machine dependent upon drop in temperature in the liquid supply bowl. The operation is positive. However, the normal feed is resumed immediately upon restoration of the bowl contents to the desired heated condition. While the preferred form has been illustrated, minor variation in design and arrangement can, of course, be carried out without departing from the scope of the invention defined in the following claims.

What I claim is:

1. In combination, a filler bowl for liquids, a feeder for placing cans beneath the bowl, a chute for delivering cans to the feeder, a stop for cans in the chute, a temperature responsive element in the filler bowl and a latch for the stop actuated by said element on an abnormal drop in the temperature within the filler bowl.

2. In combination, a filler bowl for liquids, a valved liquid inlet to the bowl, a temperature responsive element in the filler bowl, means actuated by said element for opening and closing the valve of the inlet when the level of the heated liquid varies within desired limits, a feeder for placing cans beneath the bowl, a chute for delivering cans to the feeder, a stop for cans in the chute, a second temperature responsive element in the filler bowl, a latch for the stop, and means actuated by said second named responsive element on an abnormal drop in the temperature within the filler bowl to engage the latch against the stop.

3. In combination a filler bowl for liquids, a feeder for placing cans beneath the bowl, a chute for delivering cans to the feeder, a stop for cans in the chute, a gravity operated latch for said stop, a temperature responsive element in the filler bowl and means actuated by the said element on an abnormal drop in the temperature

within the filler bowl to release the latch for engagement with the stop.

4. In combination a filler bowl for liquids, a feeder for placing cans beneath the bowl, a chute for delivering cans to the feeder, a stop for cans in the chute, a gravity operated latch for said stop, a temperature responsive element in the filler bowl and a relay circuit for holding the latch out of engagement with the stop but actuated by the said element on an abnormal drop in the temperature within the filler bowl to release the latch for engagement with the stop.

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