

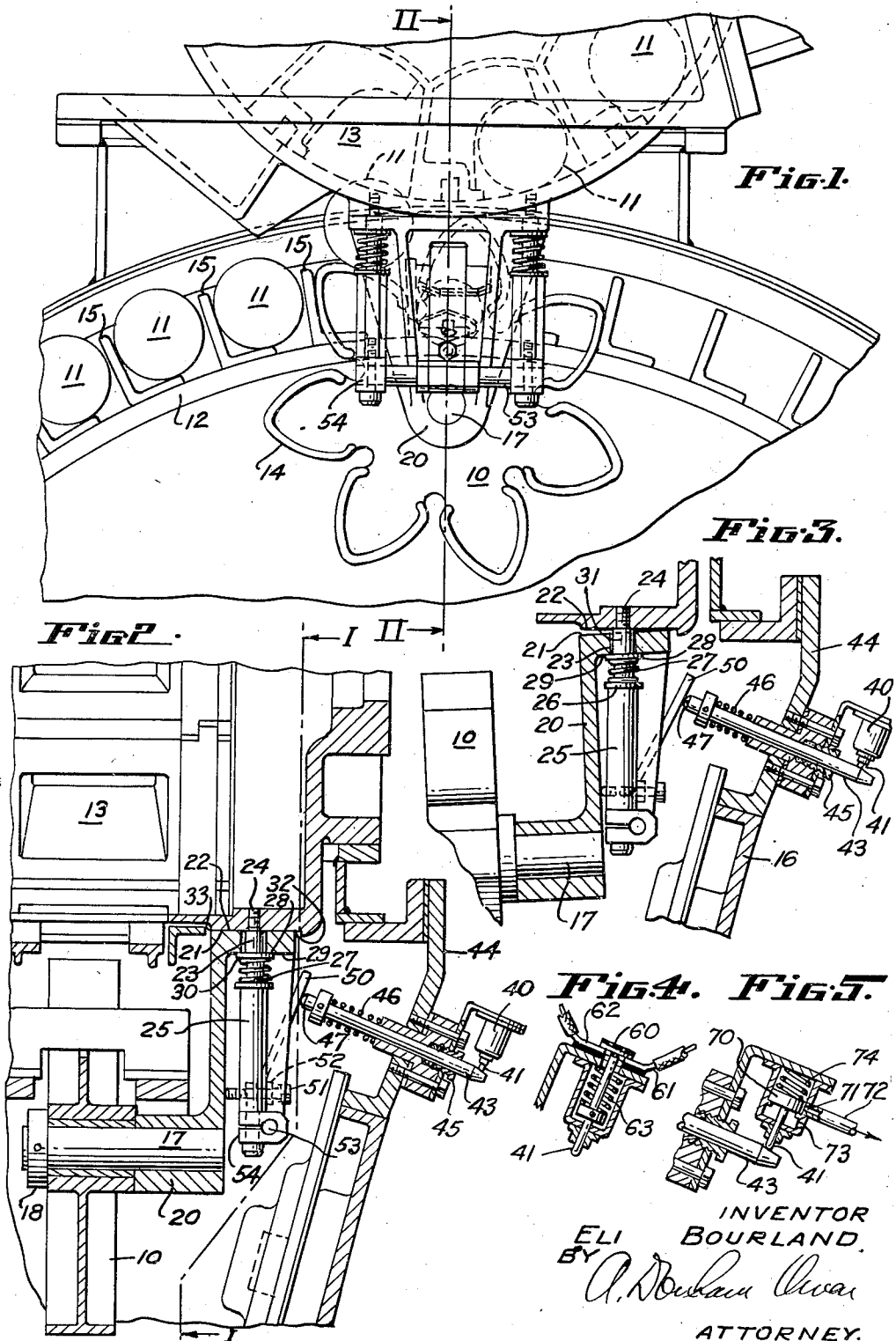
April 24, 1945.

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2,374,326

SAFETY STOP AND MOUNTING

Filed Sept. 22, 1944



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UNITED STATES PATENT OFFICE

2,374,326

SAFETY STOP AND MOUNTING

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Application September 22, 1944, Serial No. 555,249

8 Claims. (Cl. 198—232)

My invention relates to improvements in continuous cookers and coolers and particularly to means for detecting the jamming or deformation of cans while therein.

A present day continuous cooker or cooler includes a cylindrical housing 20 to 30 feet long with a reel inside for impelling the cans from one end to the other. Its capacity is about 2,450 cans. If anything happens that a deformed can should jam when being lifted out of the cooker or cooler at the end of its travel, it is important to be able to have the machine stop automatically and immediately upon this jamming being detected so that additional good cans will not be ruined by jamming against the stalled injured can. Not only is damage thus caused to other cans, but it is not uncommon that the jammed cans will cause a breakage of the end section of the impelling reel so that it must be replaced before the device can begin operating. This is a major operation and requires removal of the whole end of the cooker housing and means interruption of the cooking of some 2450 cans which in most cases will have their contents spoiled.

One of the objects of my invention is to provide a safety means for detecting a misshapened, jammed or crushed can and for stopping the whole machine before the can has had an opportunity to cause any damage.

Another object of my invention is to provide a simple form of such an automatic stop mechanism whereby the circuit for the shutdown of the machine may be placed on the outside of the housing and still be actuated from the inside.

Other objects and advantages of my invention will become apparent to those skilled in this art from the following description of one embodiment taken in connection with the drawing and filed herein pursuant to requirements of U. S. Revised Statutes, sec. 4888. It is understood that in making this description I do not intend to limit my invention to the form of any of the specific structure used for describing this embodiment.

In the drawing,

Fig. 1 is an end elevational view partly in cross-section taken on the line I—I of Fig. 2;

Fig. 2 is a vertical cross-sectional view taken on the line II—II of Fig. 1, and

Fig. 3 is an enlarged cross-sectional view of one form of yieldable support means and actuating connections.

Fig. 4 is a view in cross-section of the control unit when adapted for electric operation; and

Fig. 5 is a similar view when adapted for air or vacuum operation.

In a pressure cooker or cooler, to both of which devices my invention is applicable, it is necessary to provide a star wheel 10 or equivalent means for lifting the can bodies 11 out of the impelling reel 12 and into the transfer valve pockets 13 in which the cans are passed into the cooler from the cooker or from the cooler to the exhaust discharge chute. The star wheel 10 has the prongs 14 which project up into the spaces between the angle irons 15 on the impelling reel 12. Engagement of these teeth 14 in between the angle irons 15 rotates star wheel 10 so that its cam-like action in lifting cans 11 out of the impelling reel 12 is carried out.

If, during its passage through the cooker, a can 11 has swollen, burst, or become mashed so that it is not of normal dimensions or shape it will not readily move out of its pocket between adjacent angle irons 15 in spite of the lift imparted to it by prongs 14 on star wheel 10. Under normal operation the cans 11 may be easily and readily lifted from the impelling reel 25 into the transfer valve pockets 13.

My invention involves the provision of a yieldable mounting for the star wheel 10 so that instead of breaking off its mounting bracket 20 or allowing the jammed can to injure the end of the impelling reel 12, the star wheel 10 will back away from the impelling reel 12 and the jammed can; and as it backs away it will shut off whatever power means is being used to rotate the impelling reel and the machine will come to a halt. This halting of the machine is so effective that usually no other cans are injured than the one which caused the machine to shut down.

The defective can 11 may then be readily removed through manhole cover 16. This removal operation usually does not take over fifteen minutes and the short interruption to the cooking operation has not proven to be long enough to cause any injury to the edible material in the cans. As soon as the star wheel 10 detects the presence of a jammed can the machine stops automatically, then the operator turns off the steam cooking pressure and floods the cooker with water while releasing the pressure. Then the manhole cover 16 is removed as soon as the pressure is reduced and the damaged can is lifted out. The water is then pumped out of the cooking chamber and is replaced by steam cooking pressure. With the prior art machines the operation has usually required many hours, sometimes several days, to secure and replace the

broken parts. This almost invariably means a complete loss of 2450 cans of food in the cooker besides tying up the whole operation in the cannery with the possible additional loss of ripe fruit or vegetables which could not be canned during the tie-up.

In the drawing I show one form in which my invention may be embodied. The star wheel 10 is carried on a stub shaft 17 and is held thereon by a collar 18. The stub shaft 17 is secured in a deflectable bracket 20 which has a flat face 21 adapted to engage a correspondingly flat face 22 on the cooker housing or the transfer valve housing. When these faces are in close engagement the star wheel 10 is in its normal operating position. The faces are held in this normal position by means of a long stud 23 threaded at 24 into the cooker or valve housing. The stud has a shoulder or collar 25 to receive a washer 26 which holds a spring 27 and washer 28 against the under face 29 of bracket 20. The hole 30 in bracket 20 is elongated or relieved at 31 to permit the bracket 20 to pivot around its base corner 32 when a can causes the star wheel 10 and bracket 20 to be deflected. Such deflection causes the corner 33 of face 21 to move into the dotted line position shown in Fig. 3. By means of this mounting it is seen that by regulating the strength of spring 27 it is possible to have star wheel 10 carry out its normal function of lifting cans out of the impelling reel 12 and also to have star wheel 10 deflectably mounted when the pressure of any prong 14 against a jammed can will overcome spring 27 and cause bracket 20 to deflect. When deflected from its normal position it sets in motion means for shutting off the source of power which is driving impelling wheel 12.

In the drawing I have shown one form which this control shut-off means may take. For example, in the enlarged drawing of Fig. 3, the device is shown as actuating a control means 40. This control means may be an electric circuit breaker as shown in Fig. 4 where the contact member 60 is normally held across the terminals 61, 62 by spring 63 to close the motor control circuit relay. Whenever actuating pin 41 is moved enough to lift the contact member 60 away from the terminals 61, 62 the motor control relay will allow the main motor circuit to open and the whole machine will shut down. The control means may be through a vacuum or air valve, depending upon the designer's choice. In this case a structure like Fig. 5 would suffice. Here the piston 70 and spring 74 keeps the port 71 sealed so as to allow pressure to be maintained on the switch control line 72. When the pin 41 is moved enough to move the piston 70 beyond the edge of the port 71, the pressure in line 72 will escape through the port 73 and the machine will shut down. In either event there is the actuating pin 41 adapted to be engaged by an actuating rod 43 which projects through the end plate 44 of the pressure cooker or cooler and has a suitable packing gland 45 to prevent loss of pressure within the chamber. A spring 46 holds rod 43 in its retracted position. Rod 43 is actuated to shut valve 40 by a pivoted lever 50 which engages its end at 47. An adjustable screw 51 is secured in pivoted lever 50 and is held in correct adjustment by set screw 52. Adjusting screw 51 bears against the deflectable star wheel supporting bracket 20 so that any movement of this bracket is immediately communicated through lever 50 and rod 43 to the shut-off valve or switch actuating pin 41. Lever 50 pivots on shaft 53

clamped in caps 54 on the ends of studs 23. It will thus be seen that star wheel deflectable bracket 20 moves relatively to studs 23 and that this relative movement is imparted through screw 51 to lever 50 thence to rod 43 and actuating pin 41.

Whenever star wheel 10 meets more than the predetermined resistance in lifting a can 11 out of any pocket in the impelling reel 12, the star wheel will be deflected downwardly and its stub shaft 17 will cause corresponding deflection of mounting bracket 20 and the valve or switch 40 will be actuated and the drive means, whether an electrical motor or any other source of power, will be shut down immediately. Instead of the form of lever mechanism and rods for actuating the control switch 40 other forms will occur to those skilled in the art. As shown, the control switch 40 is placed outside the chamber. This is not essential, as it may be placed within the chamber and if it is an electrical control switch it will then require insulation against the moisture in the chamber, as well as protection against corrosion of the contact points. For these reasons, and because of the easy accessibility of having the control switch on the outside, I prefer this arrangement but I do not intend to limit myself to this embodiment. These changes may be made within the spirit of my invention, the principles of which are set forth in this description and summarized in the following claims.

I claim:

1. In a closed container of the type adapted to discharge cylindrical objects through an opening therein, the combination of carrier means having peripheral pockets for impelling said objects therein, a regulating wheel mounted adjacent said opening having means which moves into each pocket from its bottom outwardly when said pocket is adjacent said opening, resilient mounting means for said wheel whereby it will not be forced into any pocket from which it does not readily move said cylindrical object, and means actuated by the corresponding induced movement of said mounting means when said wheel does not clear out said pocket to halt said impelling means.

2. In an apparatus for transferring cylindrical objects through an opening, the combination of a chamber, carrier means having peripheral pockets for impelling said objects therethrough, powered actuated means for moving said impelling means, a regulating wheel mounted adjacent said opening and having means which moves into each pocket from its bottom outwardly when said pocket is adjacent said opening, a bracket and stub shaft for mounting said wheel inside the outer periphery of said carrier means, means for yieldably supporting said bracket and wheel in normal operating position in said chamber whereby it will not be forced into any pocket from which it does not readily move said cylindrical object but will instead effect a movement of said bracket, and means operated by movement of said bracket to stop said impelling means when said bracket is deflected from its normal position by said regulating wheel.

3. In a chamber for treating filled containers having means for impelling them therethrough, the combination of a bracket mounted in said chamber adjacent an opening therein, a stub-shaft carried thereby, a regulating wheel rotatably mounted thereon, studs secured to the inside face of said chamber, guide slots in the base of said bracket embracing said studs to

allow it to tilt in relation to said face and said studs, a lever pivoted in fixed relation to said face and movable when engaged by said bracket as it tilts in relation to said face, an actuating rod passing through the wall of said chamber, and a control means on the outside of said chamber engaged by said rod for stopping said impelling means when said lever is moved by tilting of said bracket.

4. In a transfer apparatus of the class described, the combination of a chamber having an outlet, a carrier therein having peripheral pockets, electrically actuated means for rotating said carrier therein, an ejection member journaled on a shaft in said chamber to push objects one at a time out of the pockets in said impeller and through said outlet, a deflectable bracket supporting said shaft, means for yieldably supporting said bracket in said chamber in normal operating position, actuating means movably secured in said chamber and engageable by said bracket, and switch means to open the motor circuit on the impelling means when said ejection member is deflected out of its normal operating position by said transfer member and moves said actuating means.

5. In a transfer apparatus of the class described, the combination of a chamber having an outlet, a carrier therein having peripheral pockets, electrically actuated means for rotating said carrier therein, a star transfer wheel journaled on a shaft in said chamber inside the periphery of said carrier so as to engage the underside of objects in said impeller to move them out of said pockets through said opening, a deflectable bracket in said chamber supporting said shaft, means for yieldably supporting said bracket in said chamber in normal operating position so that if said object resists removal from its pocket through said opening then the star wheel will deflect, actuating means movably secured in said chamber and engageable by said bracket, and switch means to open the motor circuit on the impelling means when said bracket is deflected out of its normal operating position by said star transfer wheel and moves said actuating means.

6. In a transfer apparatus of the class described, the combination of a chamber, electrically actuated means for impelling objects there-

through, a star transfer wheel journaled on a shaft in said chamber to engage objects in said impeller, a deflectable bracket supporting said shaft, studs secured to the inside of said chamber, said bracket fitting said studs with a clearance fit to allow tilting of the bracket in relation to the studs, yieldable means holding said bracket in normal operating position, actuating means movably secured in said chamber and engageable by said bracket, and switch means to open the motor circuit on the impelling means when said bracket is deflected out of its normal operating position by said star transfer wheel and moves said actuating means.

7. In a transfer apparatus of the class described, the combination of a chamber, electrically actuated means for impelling objects there-through, a star transfer wheel journaled on a shaft in said chamber to engage objects in said impeller, a deflectable bracket supporting said shaft, studs secured to the inside of said chamber, said bracket fitting said studs with a clearance fit to allow tilting of the bracket in relation to the studs, yieldable means holding said bracket in normal operating position, a fixed bracket secured to said studs, having an actuating lever journaled therein and engageable by said tiltable bracket, and circuit control means to open the motor circuit on the impelling means when the tilting bracket is tilted out of its normal operating position by said transfer member and moves said actuating lever.

8. In a chamber for treating filled containers having means for impelling them therethrough, the combination of a bracket mounted in said chamber adjacent an opening therein, a stub-shaft carried thereby, a regulating wheel rotatably mounted thereon, studs secured to the inside face of said chamber, guide slots in the base of said bracket embracing said studs to allow it to tilt in relation to said face and said studs, a lever pivoted in fixed relation to said face and movable when engaged by said bracket as it tilts in relation to said face, and a control means engaged by the tilting of said bracket for stopping said impelling means when said lever is moved by the tilting of said bracket.

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