

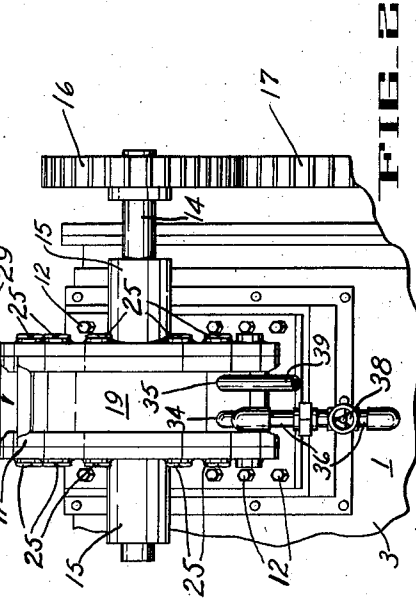
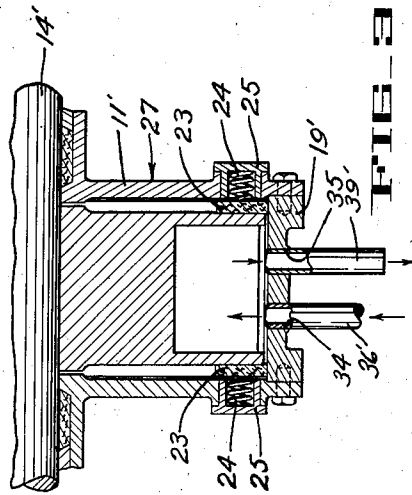
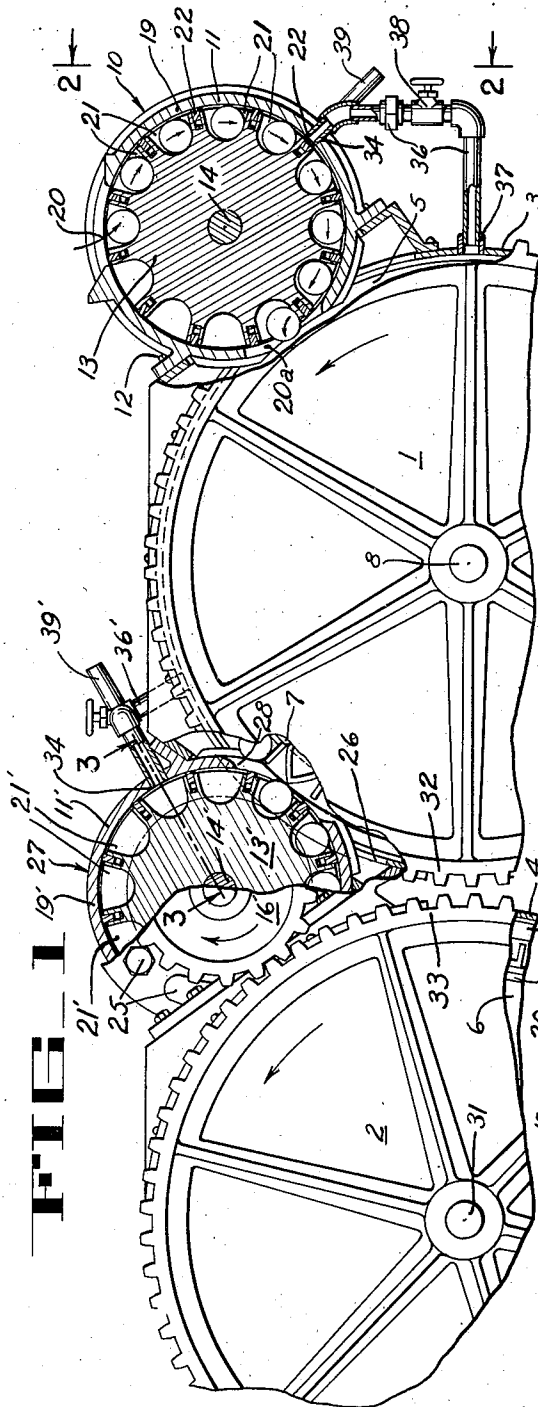
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VENTED COOKER VALVE

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VENTED COOKER VALVE

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The present invention appertains to pressure cookers having a treating chamber for treating articles therein and more particularly relates to fluid tight valves associated therewith for admitting articles to or for discharging them from said chamber.

These valves, well known in the art, admit the articles to or discharge the same from the pressure treating chamber of the cooker in a satisfactory manner and with a minimum release of pressure therefrom, however, they necessarily carry a certain amount of air at atmospheric pressure into the chamber. The air thus introduced into the chamber during continuous operation of the valves causes the formation of air pockets in the chamber which prevent complete sterilization of the articles treated unless the cooker is constantly bled whereby a continuous agitation of the treating medium in the chamber is obtained and the formation of air pockets is thereby prevented. However, irrespective of the constant bleeding of the cooker, air is continuously admitted into the treating chamber by the inlet and outlet valves thereof and mixed with the treating medium whereby the rate of heat exchange between the treating medium and the articles to be treated is reduced. Furthermore, the reduction of the rate of heat exchange requires a greater input of heat treating medium into the chamber in order to operate the cooker at its maximum efficiency.

The present invention contemplates the elimination of the admittance of air into the treating chamber of the cooker by the inlet and outlet valves and maintenance of the maximum heat exchange efficiency in the pressure medium therein.

Another object is to provide an apparatus for automatically ejecting the air from the pockets of the inlet and outlet valves of cookers prior to registration of the pockets with the treating chamber so as to eliminate the introduction of air into the same.

Another object is to provide an apparatus for venting the article carrying pockets of inlet and outlet valves of cooking apparatus and for charging the pockets with treating medium to displace the air therefrom prior to the communication of the pockets with the treating chamber.

Other and further objects and advantages of the present invention will become apparent from the description and drawings in which:

Fig. 1 is a fragmentary end view of a combined cooker and cooler and a feed and discharge valve associated therewith; certain parts are broken away while others are shown in section.

Fig. 2 is a side view of the feed valve or inlet valve shown in Fig. 1, the view being taken along line 2—2 of Fig. 1.

Fig. 3 is a fragmentary section through the

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discharge or transfer valve of the cooker and cooler taken along line 3—3 of Fig. 1.

For purposes of this application the present invention has been illustrated in association with a cooker and cooler of the type described in re-issued patent to Albert R. Thompson, No. 15,334, dated April 11, 1922. It should be understood, however, that the invention herein is equally applicable to other forms of pressure treating apparatus and, therefore, is not limited to the precise construction shown herein. Since the construction, operation, and general purpose of the cooker and cooler illustrated herein are specifically described in the above mentioned patent, only so much of its structure and operation will be given herein as necessary to a clear understanding of the present invention.

In Fig. 1 of the drawings, the cooker is indicated by reference numeral 1 and the cooler by reference numeral 2 each of which comprises a sealed cylindrical shell 3 and 4, respectively, providing separate pressure chambers 5 and 6. The chamber 5 of the cooker is supplied with steam under pressure from a source, not shown, and the steam thus supplied is maintained at suitable sterilizing pressure and temperature in a well known manner. The apparatus illustrated is adapted for handling canned goods and, as disclosed in the aforementioned patent, the cans are conveyed through the chamber 5 of the cooker along a helical track, not shown, by a reel 7, part of which is shown in Fig. 1. The cooker is provided with a central shaft 8 to which the reel 7 is secured and the shaft is driven in a conventional manner to cause the cans to move through the chamber 5 at a predetermined speed to assure maximum cooking efficiency.

The cans are supplied to the cooker 1 (Fig. 1) through a feed valve 10 comprising a housing 11 bolted, as shown at 12, in sealed relation to the shell 3 adjacent one end thereof and a rotary turret 13 mounted within the housing 11 on a shaft 14 journaled in bearings 15 on the side walls of the housing. Secured to one end of the shaft 14 is a gear 16 which meshes with a bull gear 17 in turn secured to the shaft 8 for driving the turret in timed relation with the reel 7.

The housing 11 has an annular wall 19 provided with an inlet 20 through which the cans are successively fed one after another into pockets 21 formed in the periphery of the turret 13. The pockets 21 are sealed from each other by sealing strips 22 in the partitions between the pockets which sealing strips bear against the inner face of the annular wall 19. The pockets 21 are further sealed from one another by sealing rings 23 (Fig. 3) which expand against the inner face of the annular wall 19 and are urged against the sides of the turret 13 by springs 24 supported in glands 25 threaded into the side

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walls of the housing. As the turret 13 rotates, the cans received in the pockets 21 are discharged through an outlet 20a of the annular wall 19 and fall one after another into the feed end of the helical track within the shell 3 for conveyance therethrough by the reel 7.

At the opposite end of the helical track the shell 3 is provided with an opening 26 over which either a discharge valve or a transfer valve is mounted, in sealed relation to the shell 3, through which valve the cans pass for further handling. In the present arrangement, the cans discharging from the cooker 1 discharge into a transfer valve 27 of a structure similar to the feed valve 10 described above except that the annular wall 19' of the housing 11' of the transfer valve has an inlet 28 communicating with the opening 26 of the cooker shell and an outlet, not shown, discharging into a can track 29 in the chamber 6 of the cooler for conveyance therethrough by a reel 30 in the same manner as hereinbefore explained in connection with the cooker.

The reel of the cooler is associated with a central shaft 31 and the transfer valve 27 has a turret 13' mounted on a shaft 14' to which a gear 16' is secured meshing with bull gears 32 and 33 associated with the shafts 8 and 31 of the cooker and cooler, respectively.

The cans discharging from the cooker are transferred into the cooler by the transfer valve 27 at sterilizing temperature and, if cooled too suddenly will panel due to a greater than a predetermined temperature differential, or might burst due to a greater than a predetermined pressure differential. Therefore, in accordance with common practice, the chamber 6 of the cooler is divided into several compartments each of which is supplied with a cooling medium, such as water, which attains a temperature at its can receiving end sufficient to prevent panelling of the cans and air under pressure to establish a limited pressure differential sufficient to prevent bursting of the cans while they are gradually cooled as they are conveyed through the cooler. Consequently, as the cans leave the pockets 21' of the transfer valve, air enters the pockets 21' and will be carried thereby toward the opening 26 communicating with the pressure chamber 5 of the cooker. Likewise, as the pockets 21 of the feed valve 10 receive cans through the inlet 29 thereof, air at atmospheric pressure enters the pockets 21 and as they communicate with the chamber 5 they too carry air toward the same.

From the foregoing it is apparent that as either pockets 21 or 21' approach the chamber 5 the air carried by such pockets would normally enter the chamber, admix with the steam therein and thereby lower the heat exchanging efficiency of the steam within the chamber. However, each of the housings 11 and 11' is provided with transversely aligned openings 34 and 35 in their annular walls 19 and 19' on that side thereof where the pockets approach the chamber. Threaded into the opening 34 of the feed valve 10 is one end of a conduit 36 having its other end threaded into a tapped opening 37 in the shell 3 to permit steam coming from the chamber 5 to enter each pocket as it is isolated within the housing 11 and approaching the chamber.

The conduit 36 is provided with a valve 38 or, if desired, it may be provided with a fixed orifice for controlling the discharge of steam under pressure from the chamber 5 into the pocket registered with the conduit 36. Conse-

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quently, the isolated pocket will receive a charge of steam at the pressure prevailing within the chamber 5 to eject the air from the pocket which is vented through the opening 35. The opening 35 has a pipe 39 threaded therinto for discharging the air and steam ejected from the valve pockets into the atmosphere and, if preferred, this pipe 39 may be connected to a stack, not shown, to carry the ejected air and steam away from the apparatus.

The air in the pockets 21' of the transfer valve 27 is similarly displaced by providing the transfer valve with a conduit 36' threaded into the opening 34 in the annular wall 19' of the transfer valve which conduit 36' is also communicated with the chamber 5, as shown in Fig. 1. As a pocket 21' registers with the opening 34, it is vented through the opening 35 having an exhaust pipe 39' threaded therinto in the same manner as above explained in connection with the feed valve 10.

From the foregoing, it will be apparent that as each pocket 21 and 21' is isolated within its respective valve housing and approaches the chamber it passes the openings 34 to receive a charge of steam from the chamber 5 via the conduit 36 or 36', as the case may be, to displace and eject the air from the pocket through the vent provided by the openings 35 and the conduit 39 or 39'. Consequently, as the pockets pass out of registration with the openings 34 and 35, they are completely charged with steam at a pressure and temperature comparable to that of the treating medium in the chamber 5 so that when the pockets subsequently communicate with the chamber 5 to discharge cans into the same or to receive cans therefrom, there will be no air admitted into the chamber 5 and, therefore, the steam under pressure in the chamber 5 will be maintained at its maximum heat exchanging efficiency. By eliminating the admission of air into the cooker chamber by way of the feed and discharge valves, as hereinbefore explained, it will no longer be necessary to constantly bleed the pressure chamber to eliminate air pockets therein, as was heretofore the practice, and, consequently, it will only be necessary to bleed the chamber periodically and by hand. Moreover, since the admission of air from the valve pockets into the pressure chamber 5 by way of the valves is completely eliminated, there will be no admixture of cold air with the steam pressure medium in such chamber, and, therefore, sterilization of the cans will be more efficiently accomplished. In this manner, the running time of the cooker can be shortened considerably with an assurance that the canned goods will be properly processed and the amount of steam under pressure supplied to the chamber will accordingly be reduced.

While a preferred structure for fulfilling the objects of this invention has been specifically described in conjunction with the particular form of cooking and cooling apparatus illustrated, it will be understood that various modifications and alterations may be made without departing from the spirit of the invention. I, therefore, desire to avail myself of all modifications and alterations coming within the scope of the present invention as defined in the accompanying claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In combination with a pressure treating apparatus including a pressure treating chamber, a valve for admitting articles to or discharging

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them from the chamber, comprising a housing having an opening communicating with said chamber and an opening communicating with the exterior of said chamber, means in said housing having an article carrying pocket movable from one to the other of said openings, means in said housing for sealing said pocket while intermediate said openings, means for introducing a charge of treating medium under pressure to said pocket while intermediate said openings, and means for simultaneously venting said pockets during the introduction of treating medium into the same for ejecting air therefrom prior to communication of said pocket with said chamber.

2. In a pressure treating apparatus having a chamber containing heat treating medium and a valve for admitting articles to or discharging them from said chamber, said valve comprising a housing provided with a cylindrical surface and having inlet and outlet openings therein and enclosing a rotary turret having an article carrying pocket in its periphery alternately communicable with the interior and exterior of said chamber through said openings, sealing means intermediate said housing and turret, a conduit extending from said chamber to said housing for discharging heat treating medium into said pocket as it approaches said chamber, and means for venting said pocket while it receives heat treating medium from said conduit for ejecting the

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air from said pocket prior to its communication with said chamber.

3. A valve for a pressure treating chamber comprising a housing having an inlet and an outlet opening, one communicating with the interior of said chamber and the other communicating with the exterior of said chamber, a rotary turret in said housing having a pocket for receiving an article at one of said openings and for discharging the article at the other of said openings, said valve having means intermediate said housing and turret for sealing the pocket therein during its movement between said openings, means for injecting a charge of pressure treating medium into said pocket as it approaches communication with the interior of said chamber and for simultaneously venting said pocket for ejecting air therefrom prior to communication of the pocket with said chamber.

PAUL C. WILBUR.

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