June 3, 1958 D. M. McBEAN ET AL 2,837,319

SAUERKRAUT PROCESSING APPARATUS

Filed July 30, 1954 2 Sheets-Sheet 1

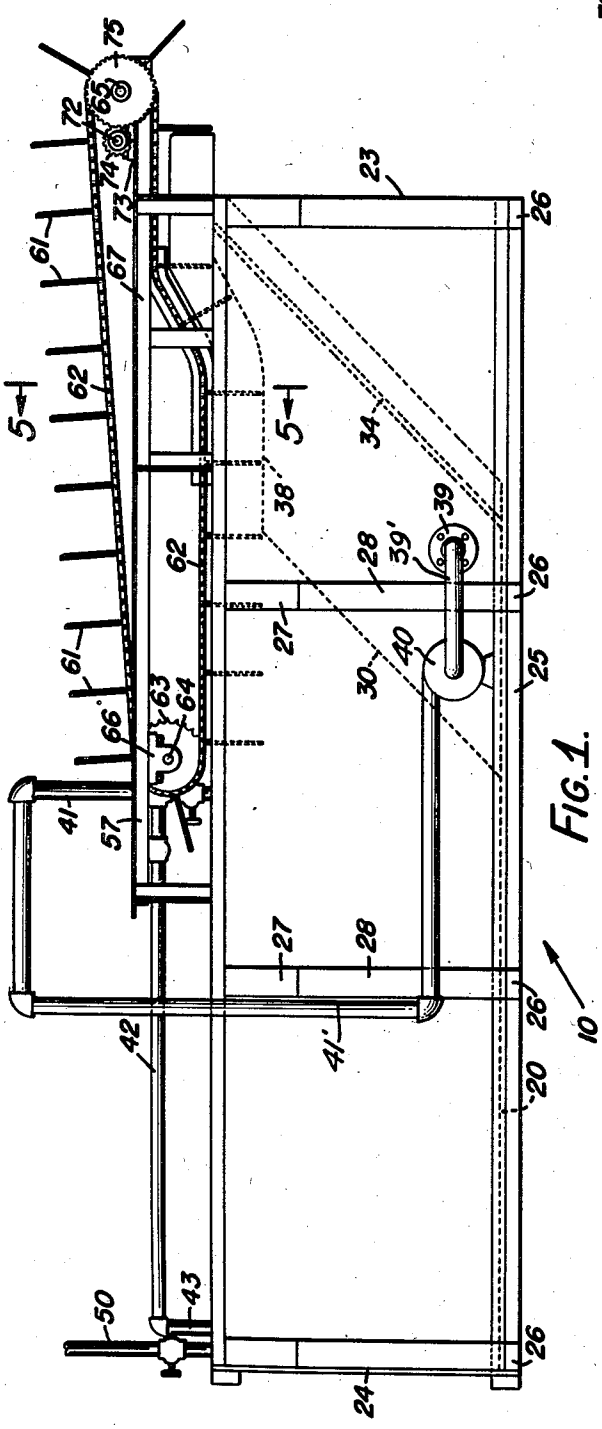


FIG. 1.

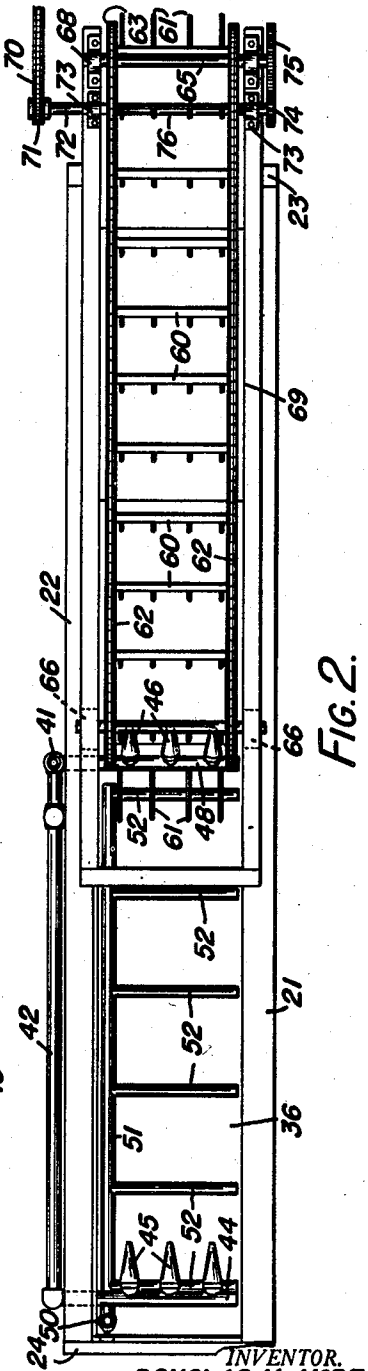


FIG. 2.

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SAUERKRAUT PROCESSING APPARATUS

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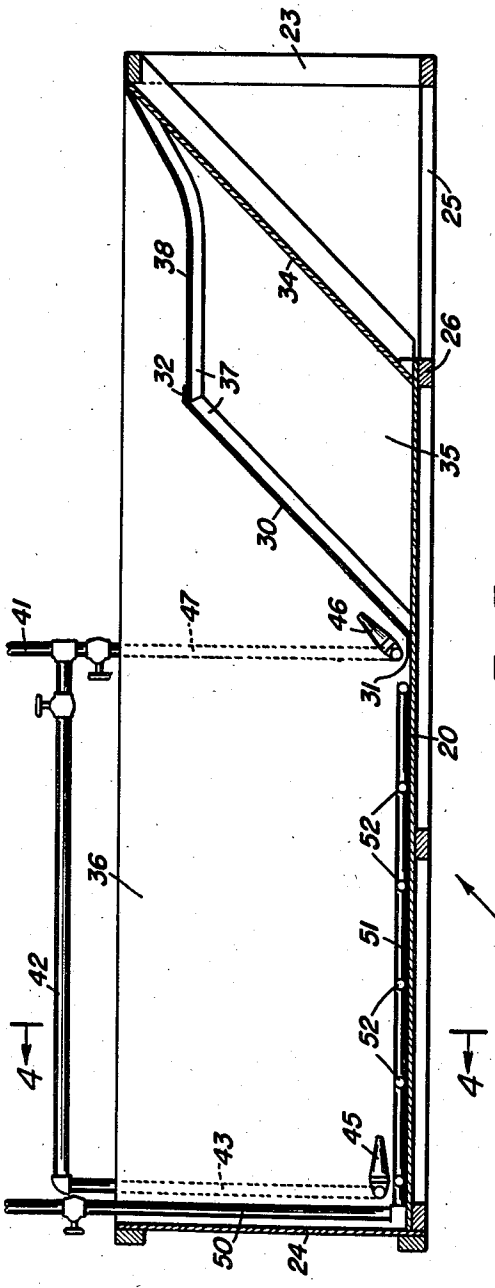


FIG. 3.

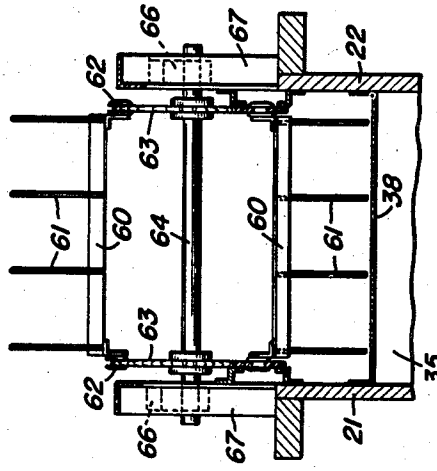


FIG. 5.

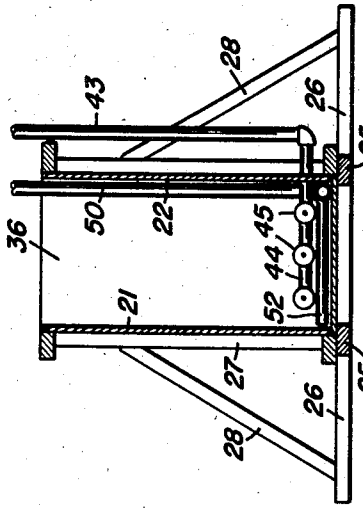


FIG. 4.

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2,837,319

SAUERKRAUT PROCESSING APPARATUS

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Application July 30, 1954, Serial No. 446,707

11 Claims. (Cl. 259—95)

The present invention relates to canning apparatus and more particularly to a soaking and filler feed tank for use with machines for canning sauerkraut.

In making sauerkraut cabbage is shredded and salted, then placed in a vat or cask and allowed to soak in the brine for several months before being canned. When the kraut is removed from the fermenting vat to be processed for canning, a substantial portion of it is usually lumped and knotted together; especially the kraut near the bottom of the vat. These knotted lumps of kraut cause a serious canning problem; for unless these knots and lumps are thoroughly unravelled it is impossible to sterilize the kraut completely, for the sterilizing steam is unable to penetrate to the cores of these lumps. As a result when the kraut is canned, some cans contain kraut which is wholly or partially unsterilized. Fermentation continues within these cans; the pressure build-up bulges the cans; and the kraut in them is unfit for consumption. As a result there is not only a sizeable loss to the canner, wholesaler, or retailer, but damage to the reputation of the trademark under which the kraut is sold.

Numerous attempts have been made to overcome this problem. One practice is to dump the kraut into a break-up tank and to "paddle" the kraut in this tank before feeding it into the sterilizer. In "paddling" the kraut large paddles which project into the break-up tank, move back and forth, breaking up the lumps of kraut. However, it has been found that this makes, mainly, small lumps out of large ones and does not thoroughly loosen the kraut. Furthermore, the paddles tend to tear the shreds or threads of kraut. This is a particularly undesirable result because the type of kraut in greatest commerical demand is long thread kraut.

Another problem with the conventional break-up tank is that of feeding the kraut from the break-up tank into the sterilizer at an even, uniform rate so that the canning machine can be run at its peak production capacity. One feeding device, that is conventionally used, is a rotatable steel drum partially submerged at one end of the break-up tank. This drum is equipped with numerous projecting spikes which pick the kraut out of the brine as the drum rotates and deliver the kraut onto an endless belt for conveyance to the canning machine. This drum has several deficiencies. Means must be provided to remove the kraut from the spikes so that it will drop onto the conveyor. The kraut tends to become lodged between the drum and the tank and, unless removed, will turn brown and decay. Therefore the tank and drum require frequent cleaning. Furthermore, the knotted lumps of kraut tend to sink in the brine out of the reach of the drum spikes, where they remain until manually removed.

The primary object of the present invention is to provide means for completely breaking up and separating sauerkraut after it is removed from the fermentation vat and before feeding it into the sterilizer.

Another object of the invention is to provide apparatus

which will break up and separate knotted sauerkraut without tearing the threads of kraut.

Another object of the invention is to provide a break-up and feed tank for separating and breaking up sauerkraut which so operates that the sauerkraut will be prevented from becoming lodged in the tank during the break-up and feeding process.

Another object of the invention is to provide a break-up and feed tank of the character described having novel means for efficiently removing sauerkraut from the tank at an even and uniform rate.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims.

In the drawings:

Fig. 1 is a side elevation of an improved break-up and feed tank constructed according to one embodiment of this invention;

Fig. 2 is a plan view of this tank;

Fig. 3 is a longitudinal, vertical section of the tank;

Fig. 4 is a transverse, vertical section through the tank taken on line 4—4 of Fig. 3 and looking in the direction of the arrows; and

Fig. 5 is an enlarged, fragmentary section taken on lines 5—5 in Fig. 1 and looking in the direction of the arrows.

Referring now to the drawings by numerals of reference, 10 denotes a generally rectangular water-tight tank which may be constructed of water-proof plywood, or other suitable material. This tank comprises a bottom or base 20, two parallel side walls 21 and 22, a forward wall 34, front braces or supports 23, and a rear wall 24. For supporting the tank 10 off and above the floor, longitudinal and transverse support planks 25, 26 are provided. Vertically disposed, spaced studding 27 is provided to reinforce the side walls and these are braced by braces 28 (Fig. 4) each of which seats at one end against the studding and at its opposite end against the transverse planks 26.

Within the tank 10 is a steel baffle plate 30 (Fig. 3) which is slanted upwardly at approximately a 45° angle and toward the front supports 23. One end of the plate 30 has a flange portion 31, projecting rearwardly, which may be secured to the base 20 of the tank by screws or in any other desired manner. The opposite end of the plate has a similar flange 32 which projects forwardly. As shown in Fig. 3, the top of this plate is below the top of the tank. It extends transversely of the tank from side to side of the tank.

The forward wall 34, slanted at substantially the same angle as the plate 30 and affixed to the sides of the tank, runs from the base 20 to the tops of the forward supports 23. The baffle plate 30 and wall 34 create a compartment 35 within the tank which is separate from the section 36 of the tank that is bounded by the rear wall 24 and the baffle plate 30. Spanning between the top of the baffle plate 30 and the top of wall 34 is a fine metal screen or perforated plate 38 which runs parallel to the base 20 for a portion of its length and then curves upwardly to its juncture with the top of wall 34. The plate 30 and screen 38 are maintained in position and supported by the wooden brace members 37 that are secured to the sides of the tank.

A pump 40 with a capacity of about 100 gallons per minute, is connected to one side 21 of the tank between the baffle plate 30 and wall 34. The flange of the pipe connection with the suction side of this pump is denoted at 39 (Fig. 1); and the pipe connection itself is shown at 39'. The delivery or pressure side of this pump is connected through piping 41' to the pipe 41. This pipe is connected through the pipes 42, 43 and 44 (Figs. 2, 3 and 4) to a series of nozzles 45 which are disposed paral-

lel to one another across the width of the rear end of the tank section 36 adjacent the bottom thereof. The pipe 41 is also connected with a vertical pipe 47 which, in turn, is connected through a horizontal pipe 48 to a second series of nozzles 46 which are disposed to extend upwardly in a direction parallel to the baffle plate 30.

Projecting into the section 36 of the tank 10 adjacent its rear side is a pipe 50 for delivering compressed air to the tank. This pipe runs vertically parallel to the wall 24. It is connected at its bottom to a pipe or manifold 51 that extends horizontally parallel to the base 20, ending at a point just short of the baffle plate 30. The pipe or manifold 51 is in communication with a plurality of parallel conduits 52, spaced along the base 20 and extending parallel thereto. These conduits are provided with numerous fine air holes in their lower sides. A compressed air line is connected with pipe 50 so that compressed air flows through pipes 50, 51 and 52, and the air holes in pipes 52, into the tank section 36.

One size tank that has been constructed according to this invention is twelve feet in overall length, six feet two and a half inches in length from the rear wall 24 to the bottom of the baffle plate 30, seventeen and one half inches wide between the side walls 21 and 22, and three feet deep. This tank is adapted to be filled with cold brine to a depth to slightly lap over that portion of the screen 38 which runs parallel to the base 20. About one ton of sauerkraut may be dumped into a tank section 36 of the size described. Due to the forward direction of flow of water from the nozzles 45 and the upward direction of flow of water from the nozzles 46, and to the suction of the pump attached to chamber 35 by flange 39, and due to the agitation produced by the compressed air flowing from pipes 52, the kraut is rolled round and round and agitated and the threads of kraut are separated from one another and carried upwardly over baffle plate 30 and onto screen or drain plate 38. The water draining from the kraut through the perforations in the screen falls into chamber 35 and is returned by the pump to pipe 41 for use again. The pump causes a continuous circulation of the water in the tank, the water being pumped out of tank section 36 over the metal baffle plate 30 and through screen 38 back into the section 36 of the tank at the bottom thereof in the entering portion of the tank where the kraut is dumped into the tank. The nozzles 46 may be omitted, if desired, but are preferably used because they help force the kraut up and over the baffle 30 into the spaces between the rakes that rake the kraut off the screen.

The kraut is adapted to be raked off the screen 38 by rakes 60 (Fig. 5) which are fastened at opposite lateral ends to two parallel endless chains 62. The tines of these rakes are denoted at 61. The chains 62 travel over two pairs of sprockets 63, one pair of sprockets being secured to a shaft 64 in axially spaced relation; and the other pair of sprockets being secured to a shaft 65 in corresponding axially spaced relation. The shaft 64 is journaled in pillow blocks 66 which are secured to a frame 67 mounted on top of the tank 10; and the shaft 65 is journaled in pillow blocks 68 which are also secured to the frame 67.

Shaft 65 is driven by a motor (not shown), a belt 70, and a pulley 71. The pulley 71 is secured to a shaft 72, which is parallel to the shaft 65. The shaft 72 is journaled in pillow blocks 73 secured to the frame 67. Secured to the shaft 72 is a spur pinion 74 which meshes with a spur gear 75 that is secured to the sprocket shaft 65. The rotation of the shafts 72 and 65 and of the sprockets 63, are synchronized with the operation of the canning machine so that kraut is raked from the screen 38 only in quantities that can be handled by the machine. The lower reach of belt 62 is so positioned that the tines mounted thereon are positioned just above the surface of the screen 38 (Fig. 5) to rake it clean during operation and to keep it from clogging. A conveyor belt, not shown, may receive the kraut as it is raked off the screen and convey it to the canning machine.

While the invention has been described in connection with a particular embodiment thereof, it is capable of various modifications and uses, and this application is intended to cover any variations, uses or adaptations of the invention following, in general, the principles of the invention and including such deparatures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth and as fall within the scope of the invention or the limits of the appended claims.

Having thus described our invention what we claim is:

1. Apparatus for processing sauerkraut comprising a tank having a rear end and a forward end, a liquid impervious baffle plate in said tank dividing it into a rear section and a forward section, the top of said baffle plate being lower than the top of said tank, said tank being adapted to be filled with kraut and liquid to a depth-level higher than the height of said baffle plate, a perforated member spanning said tank from the top of said baffle plate to the top of the forward end of said tank and through which liquid may drain into said forward section, means for continuously pumping said liquid out of the forward section of said tank and into the rear section of said tank to circulate said liquid and thereby move the kraut forwardly through said tank, over said baffle plate and onto said perforated member, means within the rear section of said tank for agitating said liquid while it is circulating.

2. Apparatus for processing sauerkraut comprising a tank having a rear end and a forward end, a liquid impervious, inclined baffle plate in said tank dividing it into a rear section and a forward section, the top of said baffle plate being lower than the top of said tank, said tank being adapted to be filled with kraut and a liquid to a depth-level higher than the height of said baffle plate, a screen spanning said tank from the top of said baffle plate to the top of the forward end of said tank and through which liquid may drain into said forward section, means for continuously pumping said liquid out of the forward section of said tank and into the rear section of said tank to circulate said liquid and thereby move the kraut forwardly through said tank, over said baffle plate and onto said screen, means within the rear section of said tank for supplying air under pressure to said liquid to agitate the liquid and the kraut therein.

3. Apparatus for processing sauerkraut, comprising a tank having a rear end and a forward end, a liquid impervious baffle plate in said tank dividing it into a rear section and a forward section, the top of said baffle plate being lower than the top of said tank, said tank being adapted to be filled with kraut and liquid to a depth-level higher than the height of said baffle plate, a perforated member spanning said tank from the top of said baffle plate to the top of the forward end of said tank and through which liquid may drain into said forward section, means for continuously pumping said liquid out of the forward section of said tank and into the rear section of said tank to circulate said liquid and thereby move the kraut forwardly through said tank over said baffle plate and onto said perforated member, said means comprising a pump, piping and a series of outlet nozzles, said nozzles being positioned in the rear section of said tank at the bottom thereof and directed toward the forward section of said tank.

4. Apparatus for processing sauerkraut, comprising a tank having a rear and a forward end, a liquid impervious inclined baffle plate in said tank dividing it into a rear section and a forward section, the top of said baffle plate being lower than the top of said tank, said tank being adapted to be filled with kraut and a liquid to a depth-level higher than the height of said baffle plate, a perforated member spanning said tank from the

top of said baffle plate to the top of the forward end of said tank and through which liquid may drain into said forward section, means for continuously pumping said liquid out of the forward section of said tank and into the rear section of said tank to circulate said liquid and thereby move the kraut forwardly through said tank over said baffle plate and onto said perforated member, said means comprising a pump, piping and two sets of outlet nozzles, said sets of outlet nozzles being mounted in the rear section of said tank, one set of said nozzles being positioned adjacent and parallel to the bottom of said tank at the rear end thereof and directed toward the forward end of said tank, the other set of nozzles being positioned on the bottom of said tank adjacent said baffle plate and extending upwardly parallel thereto.

5. Apparatus for processing sauerkraut comprising a tank having a rear and a forward end, a liquid impervious baffle plate in said tank dividing it into a rear section and a forwad section, the top of said baffle plate being lower than the top of said tank, said tank being adapted to be filled with kraut and liquid to a depth-level higher than the height of said baffle plate, a perforated member spanning said tank from the top of said baffle plate to the top of the forward end of said tank and through which liquid may drain into said forward section, means for continuously pumping said liquid out of the forward section of said tank and into the rear section of said tank to circulate said liquid and thereby move the kraut forwardly through said tank, over said baffle plate and onto said perforated member, means within the rear section of said tank for agitating said liquid while it is circulating, said agitating means being positioned in the rear section of said tank adjacent the bottom thereof, and comprising a plurality of conduits connected to a source of compressed air, said conduits being parallel to the base of said tank and having a plurality of outlet holes through which air is ejected into said liquid.

6. Apparatus for processing sauerkraut comprising a tank having a rear and a forward end, a liquid impervious inclined baffle plate in said tank dividing it into a rear section and a forward section, the top of said baffle plate being lower than the top of said tank, said tank being adapted to be filled with kraut and liquid to a depth-level higher than the height of said baffle plate, a screen spanning said tank from the top of said baffle plate to the top of the forward end of said tank and through which the liquid may drain into said forward section, means for continuously pumping said liquid out of the forward section of said tank and into the rear section of said tank to circulate said liquid and thereby move the kraut forwardly through said tank, over said baffle plate and onto said screen, means within the rear section of said tank for agitating said liquid while it is circulating, said circulating means comprising a pump, piping and a series of outlet nozzles, said outlet nozzles being positioned in the rear section of said tank adjacent the bottom thereof and directed toward the forward section of said tank, said agitating means comprising a manifold positioned in the rear section of said tank and connected to a source of compressed air, and a plurality of conduits extending from said manifold, said conduits being adjacent and parallel to the base of said tank and having a plurality of outlet holes through which air is ejected into said liquid.

7. Apparatus for processing sauerkraut comprising a tank adapted to hold kraut and a liquid, said tank having a rear wall, a forward wall, and a pair of side walls connecting the rear and forward walls, a baffle plate disposed across said tank between said rear and said forward walls and dividing said tank into a rear section and a forward section, said baffle plate extending from the bottom of the tank to a point below the top of the tank and being inclined forwardly of the tank from its bottom to its top, a foraminous member extending forwardly of the tank from said baffle plate and through which liquid may drain into said forward section, said tank being adapted to be filled with kraut and liquid to a level above the top of said baffle plate, means for pumping liquid out of said forward section into said rear section adjacent the bottom thereof, and means for supplying compressed air into said rear section to agitate the liquid and kraut therein.

8. Apparatus for processing sauerkraut comprising a tank adapted to hold kraut and a liquid, said tank having a rear wall, a forward wall, and a pair of side walls connecting the rear and forward walls, a baffle plate disposed across said tank between said rear and said forward walls and dividing said tank into a rear section and a forward section, said baffle plate extending from the bottom of the tank to a point below the top of the tank and being inclined forwardly of the tank from its bottom to its top, a foramionus member extending forwardly of the tank from said baffle plate and through which liquid may drain into said forward section, said tank being adapted to be filled with kraut and liquid to a level above the top of said baffle plate, means for pumping liquid out of said forward section into said rear section adjacent the bottom thereof, and means for supplying compressed air into said rear section adjacent the bottom thereof to agitate the liquid and kraut therein.

9. Apparatus for processing sauerkraut comprising a tank adapted to hold kraut and a liquid, said tank having a rear wall, a forward wall, and a pair of side walls connecting the rear and forward walls, a baffle plate disposed across said tank between said rear and said forward walls and dividing said tank into a rear section and a forward section, said baffle plate extending from the bottom of the tank to a point below the top of the tank and being inclined forwardly of the tank from its bottom to its top, a foraminous plate extending forwardly of the tank from said baffle plate and through which liquid may drain into said forward section, said tank being adapted to be filled with kraut and liquid to a level above the top of said baffle plate, means for pumping liquid out of said forward section and into said rear section adjacent the bottom thereof and including a nozzle disposed in said rear section adjacent the rear and bottom of said rear section and directed forwardly, and means for supplying compressed air into said rear section to agitate the liquid and kraut therein.

10. Apparatus for processing sauerkraut comprising a tank adapted to hold kraut and a liquid, said tank having a rear wall, a forward wall, and a pair of side walls connecting the rear and forward walls, a baffle plate disposed across said tank between said rear and said forward walls and dividing said tank into a rear section and a forward section, said baffle plate extending from the bottom of the tank to a point below the top of the tank and being inclined forwardly of the tank from its bottom to its top, a foraminous plate extending forwardly of the tank from said baffle plate and through which liquid may drain into said forward section, said tank being adapted to be filled with kraut and liquid to a level above the top of said baffle plate, means for pumping liquid out of said forward section and into said rear section adjacent the bottom thereof and including a nozzle disposed in said rear section adjacent said baffle plate and adjacent the bottom of said rear section and directed upwardly generally parallel to said baffle plate, and means for supplying compressed air into said rear section to agitate the liquid and kraut therein.

11. Apparatus for processing sauerkraut comprising a tank adapted to hold kraut and a liquid, said tank having a rear wall, a forward wall, and a pair of side walls connecting the rear and forward walls, a baffle plate disposed across said tank between said rear and said forward walls and dividing said tank into a rear section and a forward section, said baffle plate extending from the bottom of the tank to a point below the top of the tank and being inclined forwardly of the tank from its bottom to its top, a foraminous plate extending forwardly of the

tank from said baffle plate and through which liquid may drain into said forward section, said tank being adapted to be filled with kraut and liquid to a level above the top of said baffle plate, means for pumping liquid out of said forward section and into said rear section adjacent the bottom thereof and including a plurality of nozzles disposed in said rear section adjacent the rear and bottom thereof and directed forwardly and a plurality of nozzles disposed in said rear section adjacent the bottom thereof and said baffle plate and directed forwardly and upwardly generally parallel to said baffle plate, and means for supplying compressed air into said rear section to agitate the liquid and kraut therein.

References Cited in the file of this patent

UNITED STATES PATENTS

1,744,785	McTaggart	Jan. 28, 1930
1,790,902	Cowles	Feb. 3, 1931
2,249,792	Skinner	July 22, 1941
2,292,897	Nielsen	Aug. 11, 1942
2,381,652	Dishauzi	Aug. 7, 1945
2,582,802	Terrell	Jan. 15, 1952