

Oct. 16, 1934.

W. E. NICHOLAY
PROCESS OF BLANCHING

1,976,801

Filed June 2, 1933

2 Sheets-Sheet 1

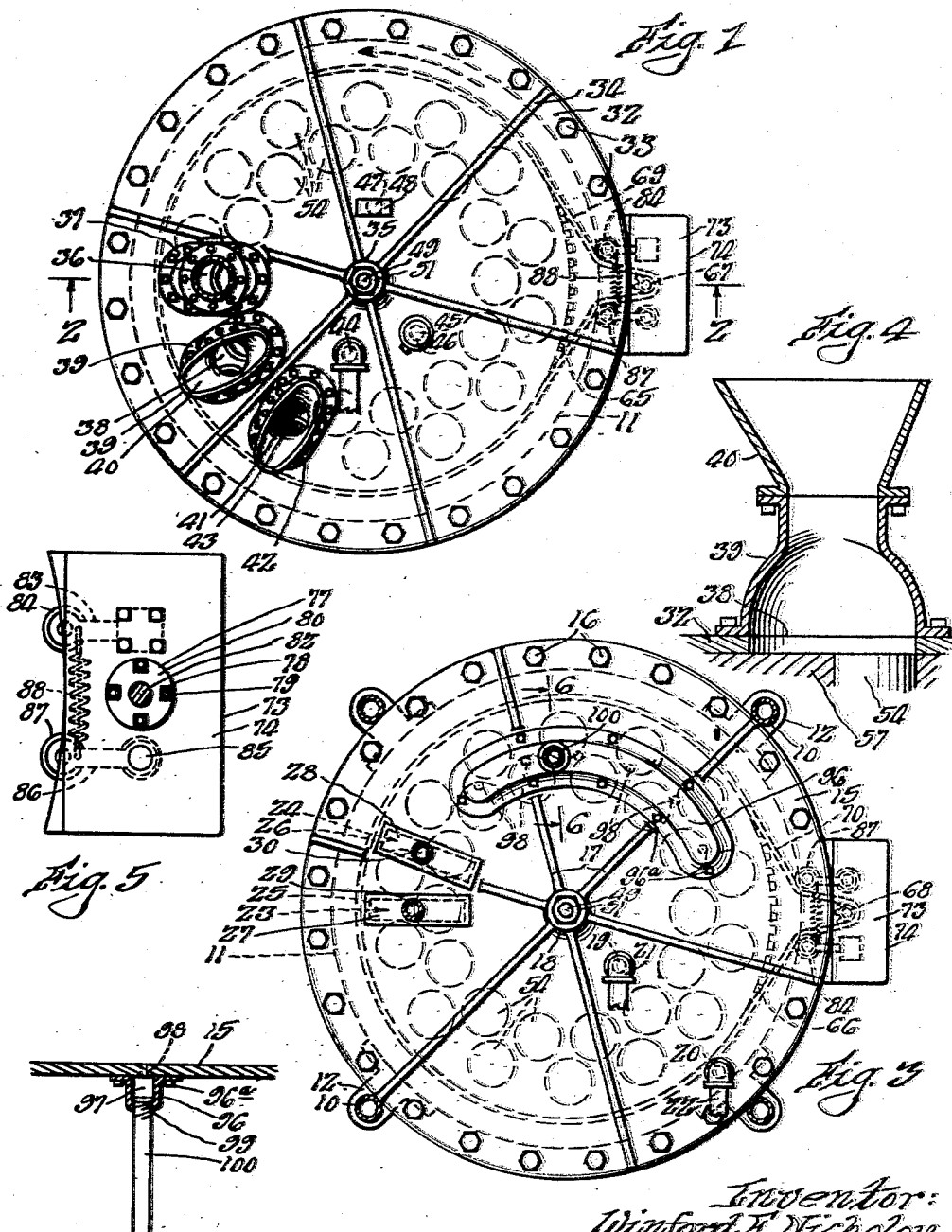


Fig. 6

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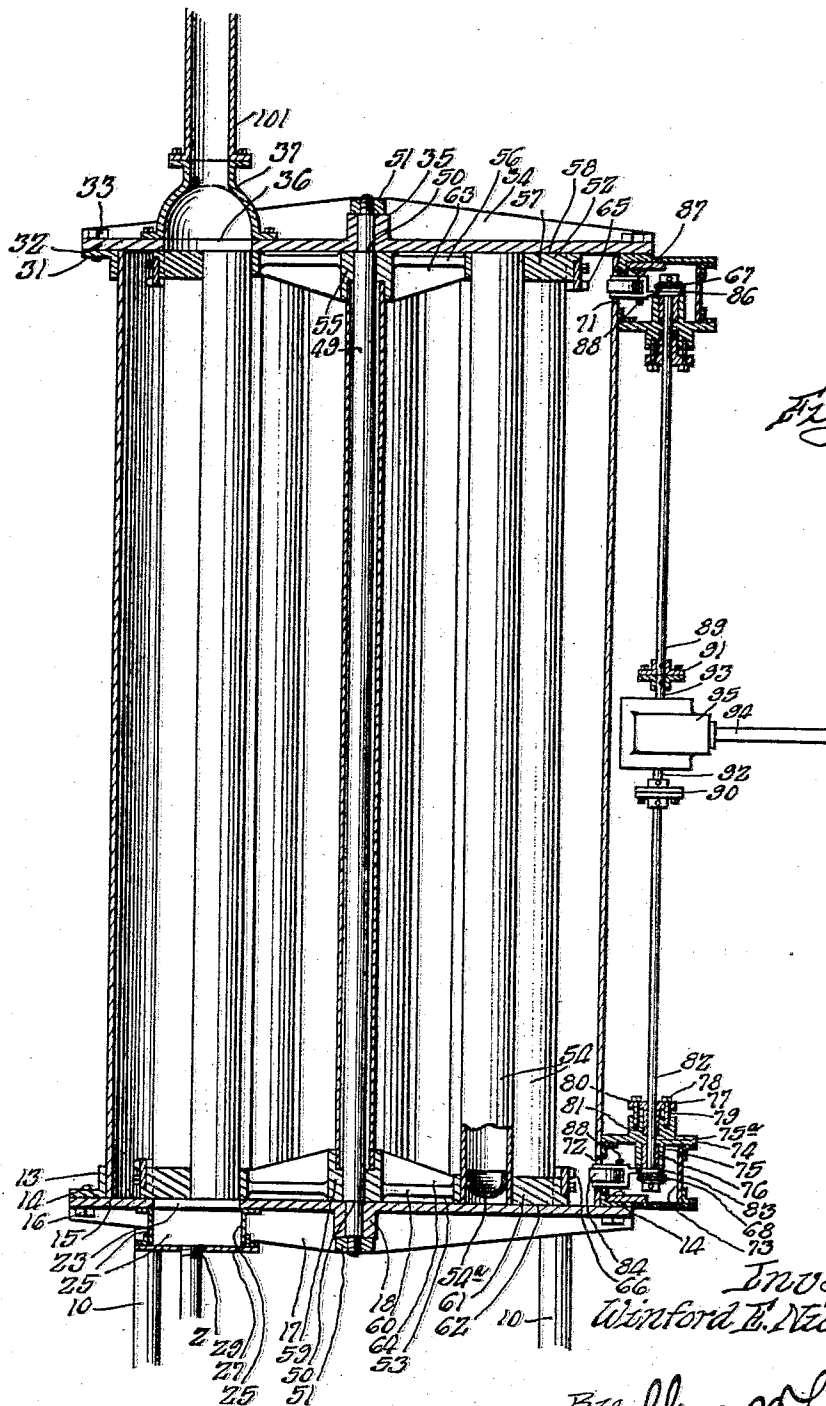


Fig. 2

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UNITED STATES PATENT OFFICE

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PROCESS OF BLANCHING

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Application June 2, 1933, Serial No. 673,935

1 Claim. (Cl. 146—219)

The present invention relates to vegetable canning equipment and more particularly to a machine to combine within itself a hydraulic elevator, a washer, and a blancher.

To the present time the process of blanching has been an art wholly independent of the washing and elevating process. Peas and other materials have been carried within tubes rotated about a centrally located axis, and parallel thereto, to be intermittently placed intermediate a conduit containing water under pressure, and a discharge conduit into which the materials were discharged onto screens or into vats, or to other receptacles.

The objects of the present invention, among others, include the following:

To provide a novel means whereby peas or other cannable materials are concurrently washed, blanched, and elevated;

To provide an improved process and apparatus to decrease the time necessary to blanch a given quantity of peas;

To introduce an unique system of applying steam in a blanching process;

A novel method of blanching in which the apparatus for blanching is confined within the area of a hydraulic elevator; and

To provide a machine to accomplish the above named objects in a uniform, progressive, and uninterrupted manner.

With the above objects and other desirable objects which appear throughout the following description in view, the invention resides in the unique construction, novel combination, and improved arrangement of the elements set forth in the following specification and appended claim, and in the process in which such elements are used.

With reference to the accompanying drawings where several figures are presented and in which like reference figures are indicative of the same parts;

Figure 1 is an orthographic top view of a blancher embodying the invention with parts removed;

Figure 2 is a section taken in elevation as indicated by line 2—2 in Figure 1;

Figure 3 is an orthographic bottom view of the blancher with parts removed;

Figure 4 is an orthographic illustration of a pea hopper;

Figure 5 is a plan view of a gear box in detail; and

Figure 6 is a transverse sectional view of the steam manifold taken at line 6—6 in Figure 3.

Reference is first had to Figure 2, where it will

be observed that legs 10, placed at equal intervals about a cylindrical shell 11 are secured thereto by brackets 12 at points in a common horizontal plane, and serve to support the blancher. At the bottom of shell 11 is a flanged collar 13, articulated to incorporate a flange 14, to which is secured bottom plate 15 by means of bolts 16.

The bottom plate 15 embodies a number of reinforcing ribs 17 radiating from hub 18. Also, it embodies threaded holes 19 and 20 to receive nipples for the accommodation of elbows 21 and 22.

Near the left side of the bottom plate is a rectangular pump discharge opening 23 and auxiliary pump suction opening 24, both lying longitudinally to the radii of the plate. To cover openings 23 and 24 are chests, parallelepiped in shape, constructed with vertical side members 25 and 26 and bottom plates 27 and 28 respectively, there being therein holes 29 and 30.

To the underside of bottom plate 15 is secured an arcuate manifold 96 by means of studs 96a. Said manifold has a chamber 97 which covers small apertures 98 extending through the bottom plate 15. Apertures 98 are of equal radii from hub 18 and at such a distance therefrom that they lie within a narrow path common to the outer and inner rows of blanching tubes 54, and to be transversely by both rows of said tubes. In the lower and outer wall of the manifold is a circular opening 99 which contains threads engaged by a steam pipe 100.

The top of cylindrical shell 11 is enclosed similarly to the bottom by the combination of an angle collar 31 flush with the top of the shell securing top plate 32 thereto by means of bolts 33. Reinforcing ribs 34 radiate at equal angles from hub 35 in the top plate. Directly above pump discharge opening 23 is an elliptical discharge opening 36 in the top plate 32 covered by casting 37, the discharging part of the device. Looking down on the top plate 32, counterclockwise and adjacent to a discharge opening 36, is a similar elliptical opening 38, the pea filling opening, which is covered by the pea filling casting 39. In Figure 4 is shown a hopper 40 attached to feed the pea filler casting 39. Counterclockwise and adjacent to opening 38 is a third similar elliptical opening 41, a water opening, covered by casting 42. Covering opening 41 and flush with the under surface of the top plate 32 is a screen 43.

Elsewhere in the top plate is steam inlet opening 44, safety valve opening 45 and safety valve 46, and pressure gauge opening 47 and pressure gauge 48.

Between hubs 18 and 35 is main shaft 49 with shoulders 50 to lie adjacent the inner surfaces of end plates 15 and 32, there to coact with nuts 51 on either end, and prevent longitudinal movement and rotation thereof.

Top rotor casting 52 is identical to bottom rotor casting 53, and the two, with the pea blanching tubes 54 intermediate, go to make up a cage to rotate about the main shaft 49. In the bottom of each blanching tube is a screen 54a (see Figure 2). The top rotor casting comprises a hub 55, the spokes 56 radiating therefrom terminating in an annular rim 57 with a flat face 58 contiguous to the plain inner surface of top end plate 32.

Similarly, bottom rotor casting comprises hub 59, spokes 60, and annular rim 61, with flat face 62 contiguous to the inner flat surface of bottom end plate 15. Spokes 56 and 60 have ribs 63 and 64, respectively, which are integral and co-extensive therewith. To the periphery of rotor castings 57 and 61 are, respectively, rotor drive sprockets 65 and 66 operatively connected to driving sprocket wheels 67 and 68 by means of roller chains 69 and 70.

Lying in common vertical elements of cylindrical shell 11 are rectangular openings 71 and 72. These openings provide for the driving means for the rotor drive sprockets 65 and 66. The driving means adjacent openings 71 and 72 are identical. A description of one will suffice.

Covering opening 72 is a gas tight gear box 73 securely fastened to shell 11 and angle collar 14. The top plate 74 of gear box 73 contains an integral journal with an internal circular shoulder 75a, and block 75 of which the lower end is lined with a stationary bushing 76. The upper and outer end of block 75 is lined with an adjustable bushing 77. Bushing 77 is drawn downwardly by tightening the nuts 78 on studs 79 against the flange 80 of said bushing to compress the packing 81 more firmly against circular shoulder 75a and driving shaft 82 to thus insure a gas tight joint. Sprocket wheel 68 is carried at the lower end of shaft 82 in alinement with and to drive annular sprocket ring 66.

The plan of gear box 73 is shown in Figure 5, which shows a horizontal chain guide 83 anchored in a stationary manner to the under side of top plate 74 and on the far side of journal block 75. The free end of chain guide 83 is bifurcated to carry a roller 84 which rotates about the vertical axis thereby provided. Anchored to the near side of the top plate 74 and in alinement with the anchorage of arm 83 and journal block 73 is a chain guide bearing pin 85. One end of chain guide 86 is secured to pin 85 in a pivotal manner, and carries between divided elements of the free end a chain guide roller 87 in a horizontal plane common to roller 84, sprocket wheel 68, annular sprocket ring 66, and chain 70, to rotate about a vertical axis. Between the free ends of chain guides 83 and 86 is a contracting coil spring 88 tending to pull chain guide roller 87 toward chain guide roller 84 against the tension of the continuous chain 70, to thus keep said chain taut.

The similar mechanical arrangement about opening 71 at the top of the shell 11 drives annular sprocket ring 65 through actuation of driving shaft 89.

Flange couplings 90 and 91 couple shafts 82 and 89, respectively, to shafts 92 and 93, which are operated concurrently by a connection to main operating shaft 94 within housing 95, which, in turn, is actuated by a prime mover not shown.

The operation of this machine is as follows. First, the entire chamber formed by shell 11 and the end plates is filled through inlet 44 with steam under pressure. The resulting steam pressure in the shell is indicated by a steam pressure gauge 48 attached at opening 47. A safety valve 46 attached at opening 45 will be actuated to release the pressure before it can do damage or rupture the walls of the chamber.

The prime mover will then turn the rotor castings, by means of the intervening linkage and chains 69 and 70, the rotation being in an anticlockwise direction as viewed from above. Assuming no peas to be within any of the blanching tubes, the blanching tube immediately under the pea feeder hopper 40 will be charged with peas from a source not shown and by means of feeder hopper 40. The peas are held in the tube by screens 54a in the bottom thereof. During the filling of this blanching tube, it has been rotated by the rotor casting from under the pea feeder hopper 40 to be thereby cut off from the source of supply.

The next stage of operation will occur as the blanching tube reaches the water opening 41, where water, previously heated to the boiling point, is introduced into the tube to fill the space around the peas. Here, as before, the supply communicating to the blancher tube, is cut off by the tube being rotated from under the supply opening. The screen 43, which is flush with the lower face of the opening 41, prevents any of the peas from being buoyed by the water into line with the lower edge of the opening to be sheared incident to the passing of the tubes therefrom under. What slight amount of water remains in the tube serves to cushion the peas as they drop into the tube. When this particular tube illustrated has transversed the pea filler hopper and the water filler hopper, the tubes successively following are transversing the same stages and in the same order.

After passing the water opening, the blanching tube next passes over a series of steam jets 98 which inject steam therein from pressure within the closure 97 of the manifold 96 and supplied thereto by steam pipe 100 connected to a steam source. Thus, the tubes are entirely surrounded by hot steam within the chamber and are supplied by additional live steam through jets to facilitate a higher ambient temperature to lend greater speed to the blanching process. As the tube continues in its counterclockwise movement, it eventually arrives under discharge opening 36 and concurrently over opening 23 in the bottom plate 15. At this time water under pressure from a source not shown is supplied along with a quantity of air through a co-opening 29 within chest 25 and through opening 23 to discharge the peas upward through pea discharge casting 37 and into a conduit 101.

Before reaching the discharge opening 36, the peas have been thoroughly blanched by the heating effect of the steam within the chamber and also injected within the tube. The tube then rotates further to be positioned over the pump suction opening 24 where most of the water remaining in the tube, after passing the discharge opening stage, is drawn from the tube by an auxiliary pump, not shown, and before said tube is transported to register with the pea filler opening. Part of the discharge opening is ahead of the pea filler opening. Simultaneously, at the pea filling station as the remaining water is being sucked from the tube, the peas through pea

filler casting are being fed into the tube, and screen 54a prevents these peas from passing beyond the tube.

5 The amount of peas allowed to fall within a blanching tube is regulated by the speed of the rotor casting, as is the amount of water permitted to enter the tube for discharging the peas in the stage just preceding. In the stage following the pea filling stage, where hot water is
10 allowed to fill the tube, the water fills the tube completely, and, since the bottom of the tube is sealed by being in contact with the bottom plate and the opening in top plate is screened to prevent peas from floating out of the tube into the
15 water inlet to be damaged by the rotor, an excess of water cannot possibly be supplied.

20 Openings 19 and 20 in the bottom plate 15 and on either side of flat annular rim 61 of the rotor provide a means of escapement for condensed steam as it accumulates within the chamber when it is cooled.

25 The water as introduced into the blanching tube at the pump discharge opening 29 may be heated so that such water upon entering the tubes will not cool them. It is only necessary to pump the quantity of one full tube of water into a tube to elevate all of the contents into the pea discharge opening. This same water is removed from the tube in the next operation by a suction pump through the pump suction opening 30,
30 and while that tube is being filled with peas. The water so sucked from the tubes is conducted to a reservoir from which the discharge pump is supplied, hence the same water, except for a
35 small amount of make-up water to replace the loss in the elevation operation, is continuously utilized for elevation of the peas. Therefore this circulating body of water when heated to approach the temperature of the tubes will not

cool the tubes, whereby the blanching process is expedited.

The water carried with the blanched peas into the discharge conduit is recovered when the peas are separated therefrom to be reheated and re-introduced at water opening 41. 80

Thus all water used in connection with the blancher is kept at a high temperature and used in a continuous cycle until it accumulates a certain amount of foreign matter when it is replaced. The whole process tends to decrease the time required to blanch a given quantity of peas which fact materially increases the quality thereof, and minimizes the destruction of valuable vitamins and mineral salts. 85 90

Agitation of the peas by water being introduced into the blanching tubes for the blanching process and for the elevating process, in addition to further agitation effected by injection of steam into the filled tubes, accomplishes a thorough washing of said peas. A rinsing is given the peas after they have been delivered by the discharge tube to vats or screens and separated from the blanching water which is salvaged, because of its high temperature, for further use. 95 100

The invention is adaptable to the blanching of various vegetables or fruits, and while specific reference has been had to peas, it is understood that no limitation is thereby intended.

What is claimed as new and is desired to be secured by Letters Patent of the United States is: 105

That process of washing, blanching, and elevating a material which comprises the steps of loading material into a vessel within a steam chamber, loading the vessel with a hot fluid, injecting steam into said vessel at intervals, and discharging the material and fluid from said vessel while still within said steam chamber. 110

WINFORD E. NICHOLAY.

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