

Aug. 4, 1942.

L. H. PLATT ET AL

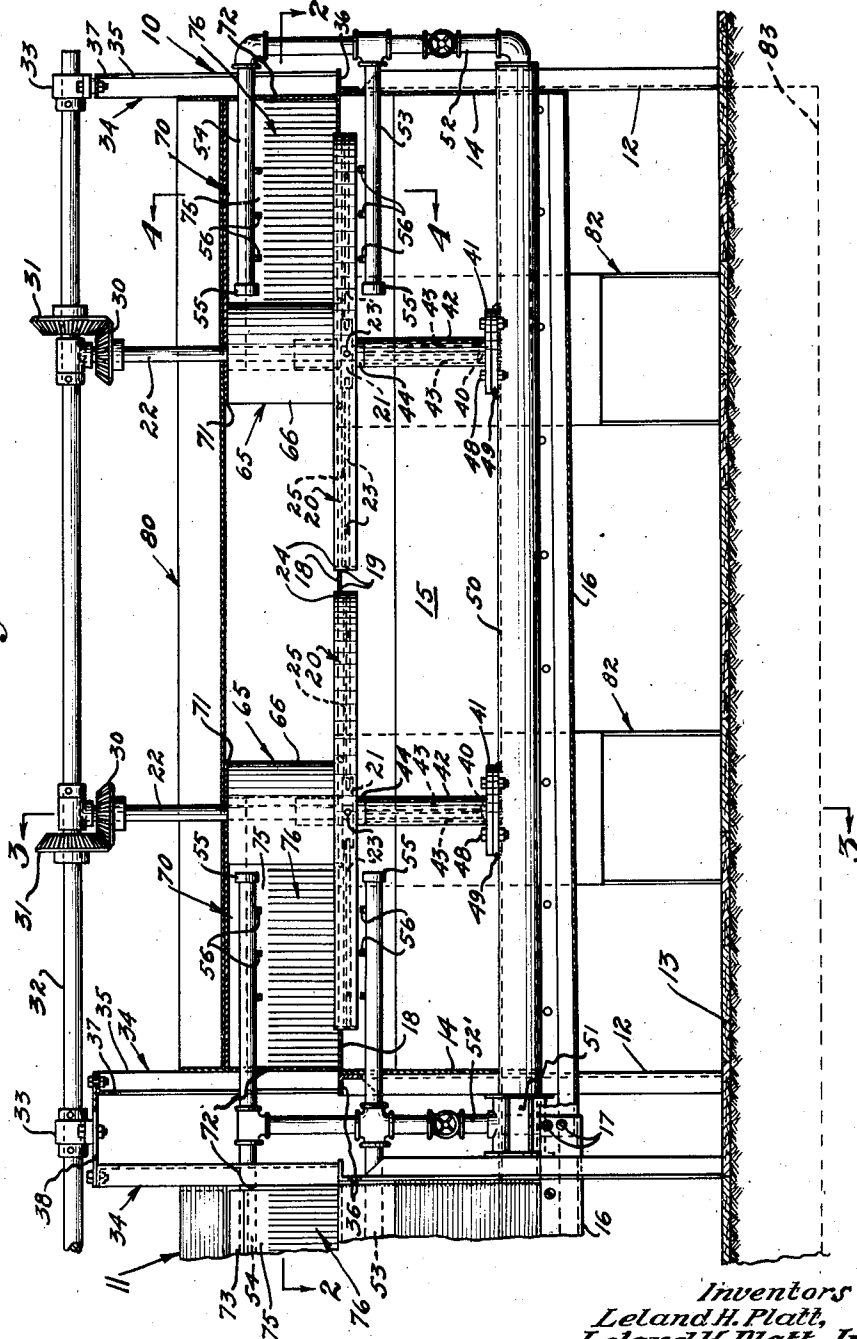
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PRODUCE WASHER

Filed March 22, 1941

6 Sheets—Sheet 1

Fig. 1.



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6 Sheets-Sheet 2

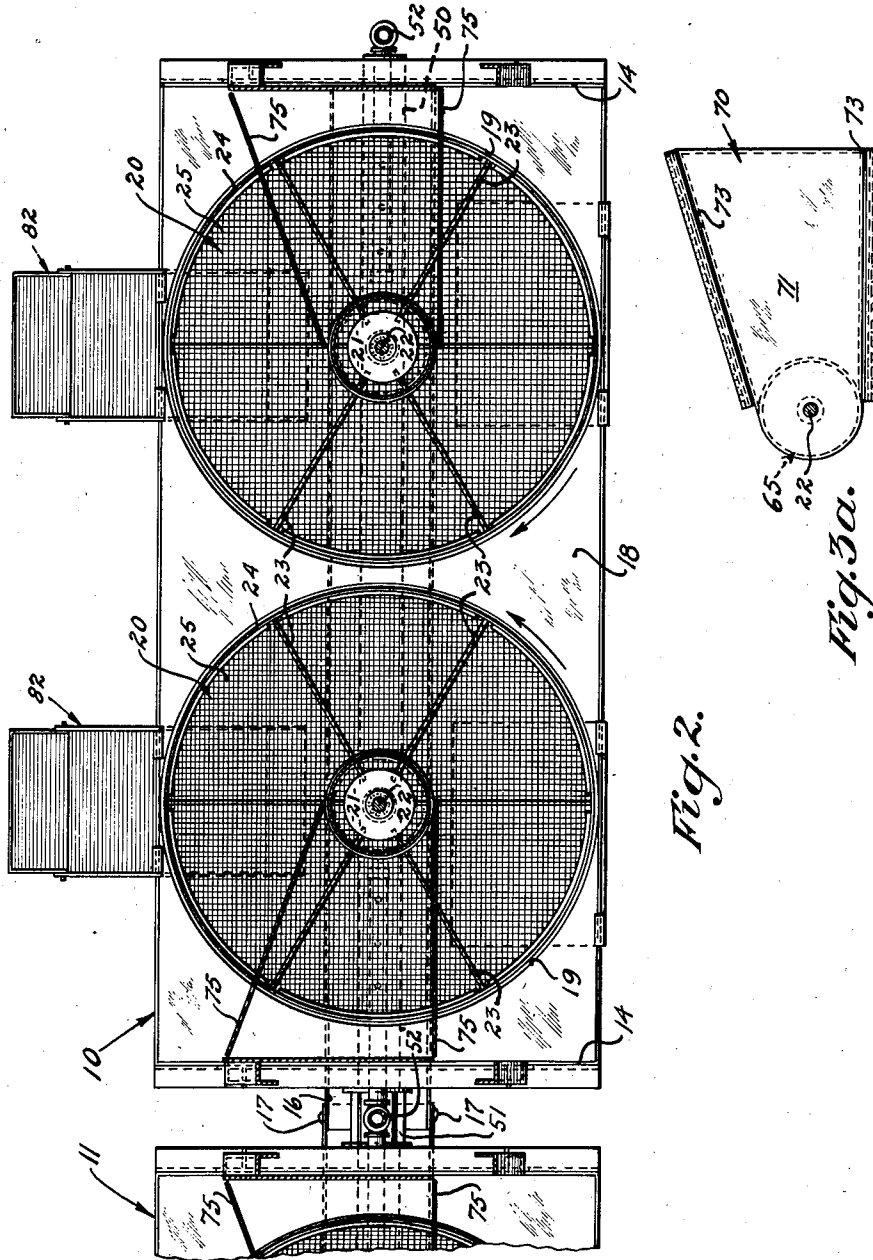


Fig. 2.

Fig. 3a.

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PRODUCE WASHER

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6 Sheets-Sheet 3

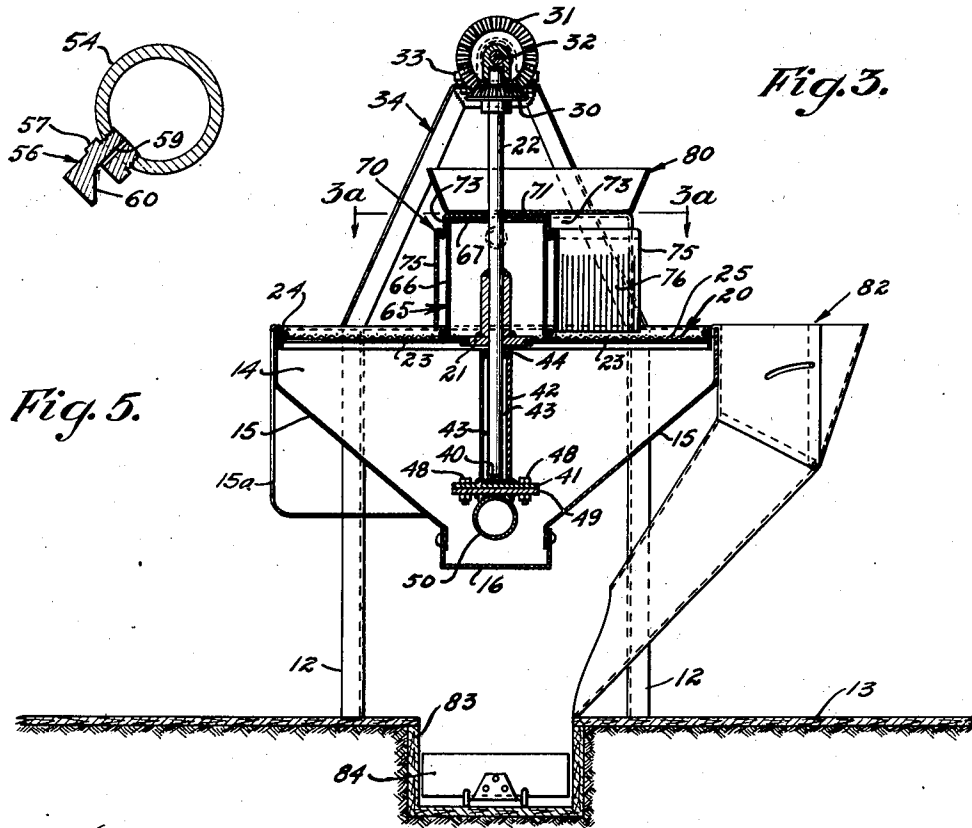


Fig. 3.

Fig. 5.

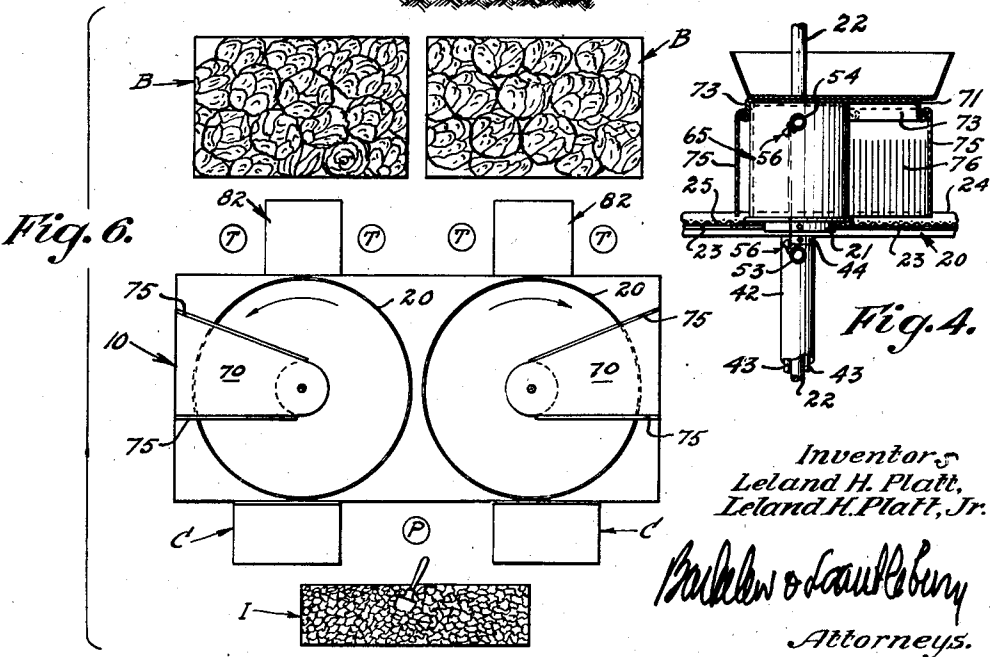


Fig. 6.

Fig. 4.

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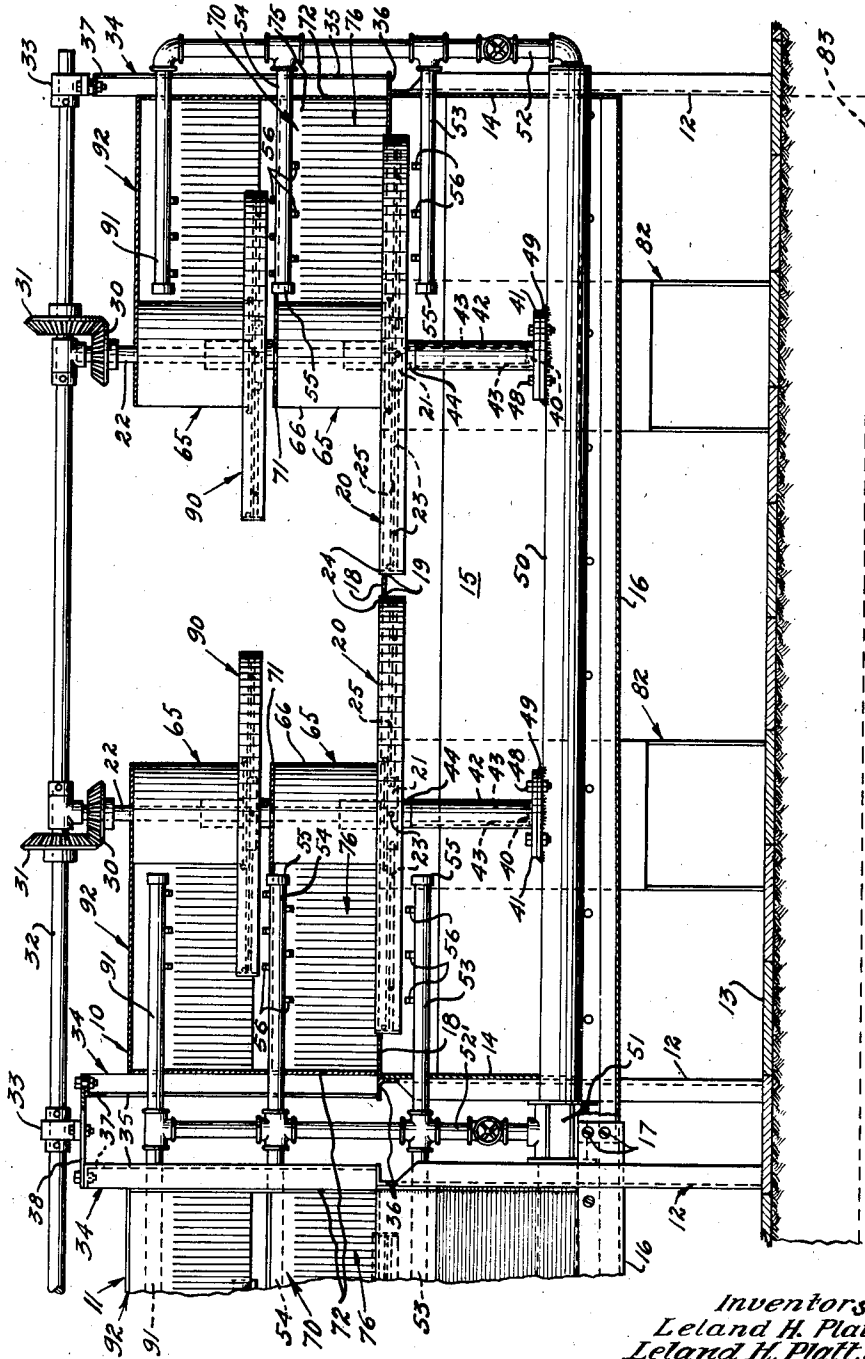
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PRODUCE WASHER

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6 Sheets-Sheet 4

Fig. 7.



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PRODUCE WASHER

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6 Sheets-Sheet 5

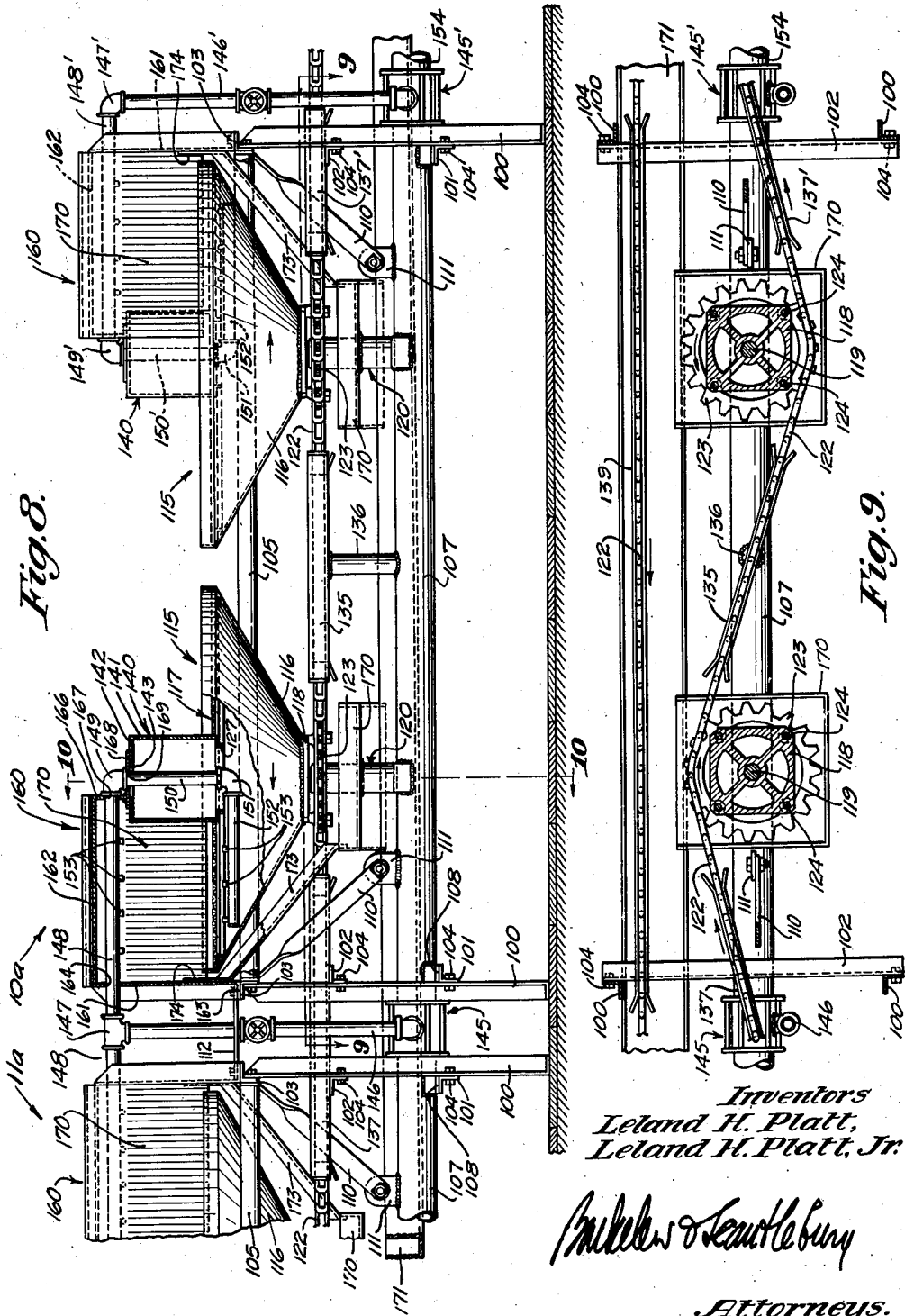


Fig. 8.

Fig. 9.

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PRODUCE WASHER

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6 Sheets-Sheet 6

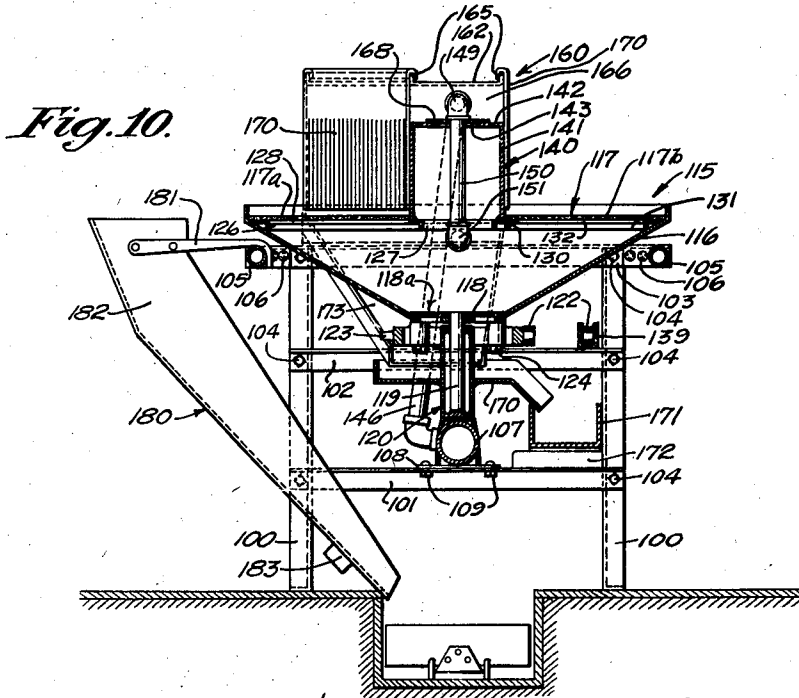


Fig. 10.

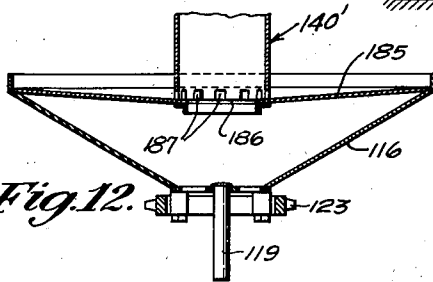


Fig. 12.

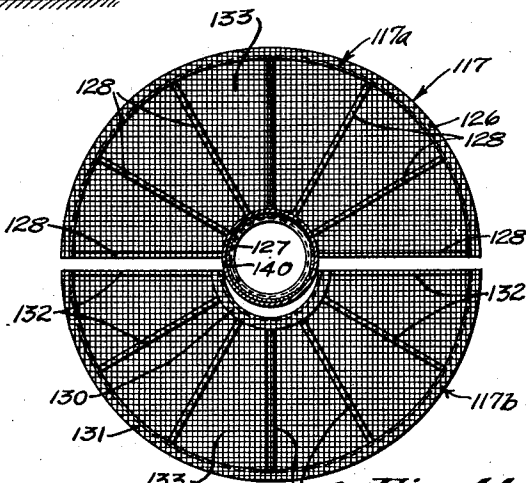


Fig. 11.

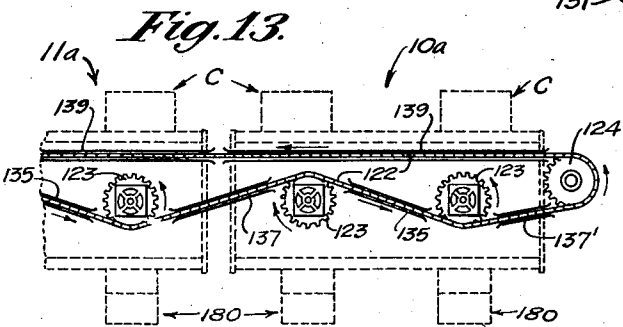


Fig. 13.

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UNITED STATES PATENT OFFICE

2,292,240

PRODUCE WASHER

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Application March 22, 1941, Serial No. 384,688

3 Claims. (Cl. 146—194)

This invention relates generally to produce washers, particularly to washers for such produce as lettuce and the like which requires trimming prior to washing and packing, and which may be thoroughly and effectively washed by spraying with wash water.

It is a common practice in produce packing houses to trim, wash and pack lettuce and the like by providing a row of wash tables, along one side of which the trimmers stand, and along the other side the packers. The produce is sprayed with wash water while on the tables. Field boxes filled with lettuce are brought to the trimmers, who take the lettuce from the boxes, trim off the undesirable outside leaves, or otherwise prepare or select the produce, and place it on the table under the sprays. The packers standing at the opposite side of the table, take the lettuce from under the sprays, sort it, and pack it in packing crates with ice, or do whatever else is required to be done with the washed produce. Under ordinary circumstances one packer can handle the output of about four trimmers, and accordingly there is usually a group comprising four trimmers working at one side of the table and one packer working at the other. This practice has certain disadvantages, however, as the lettuce has to be moved across the table by hand, which in itself is a time consuming operation, and in so doing both the trimmers and the packer unavoidably encounter the spray water, making working conditions both difficult and uncomfortable.

Primary objects of the present invention are the provision of a wash table or unit equipped with simple mechanical means for moving the produce from the trimmers through the sprays to the packers; and to keep the produce in a position easily available to the packer, meanwhile repeatedly washing it, until the packer picks it up.

A further object is the provision of a produce washing machine which will occupy substantially no more floor area than the wash tables presently in use, and which can accordingly be installed in present produce packing houses with a minimum of disturbance of existing plant facilities and no necessary increase in floor area.

In accordance with the present invention, the wash units are equipped with oppositely rotating turn tables; preferably, assuming four trimmers and one packer assigned to a wash unit, each wash unit has two such turn tables. The four trimmers deposit the trimmed lettuce on

the turn tables at one side of the wash unit, the turn tables immediately take the lettuce through the sprays, which are preferably hooded over to prevent splashing, and the packer standing at the opposite side of the unit removes the lettuce from the turn tables as it comes to him after passing through the sprays one or more times. The lettuce or other produce is thus transported across the wash unit without manual effort, and is sprayed in course of transit, without the necessity of either the trimmers or the packer reaching in under the sprays; and the produce is repeatedly passed through the sprays and presented to the packer until he picks it up. Preferably, sprays may be provided both above and below foraminous turntables, the lower sprays reaching the produce through the mesh of the turntables, so that the produce is thoroughly washed both top and bottom.

Other objects and features of the invention will appear in the course of the following detailed description of certain present preferred embodiments of the invention, reference for this purpose being had to the accompanying drawings, in which:

Fig. 1 is a vertical longitudinal section, partly in elevation, of a wash unit in accordance with the present invention;

Fig. 2 is a horizontal section taken on line 2—2 of Fig. 1;

Fig. 3 is a transverse vertical section taken on line 3—3 of Fig. 1;

Fig. 3a is a section on line 3a—3a of Fig. 3;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 1;

Fig. 5 is a detail section through a spray pipe and spray nozzle;

Fig. 6 is a floor plan illustrating the lay-out and use of the present invention;

Fig. 7 is a view generally similar to Fig. 1 but showing a modification;

Fig. 8 is a view generally similar to Fig. 1 but showing a variational form of drive and also certain simplifications in structure;

Fig. 9 is a plan section taken on line 9—9 of Fig. 8;

Fig. 10 is a vertical section taken on line 10—10 of Fig. 8;

Fig. 11 is a detailed plan view of the turntable shown in Figs. 8 and 10;

Fig. 12 is a detailed vertical section of another form of turntable; and

Fig. 13 is a schematic view illustrative of the driving arrangement for a row of units.

A plurality of the wash units of the present invention are adapted to be installed end to end in a row, all driven from a single prime mover. The drawings illustrate only the end unit of such a row, together with a portion of the unit next to it, it being understood that as many such units as desired may be installed and interconnected in the manner to be described. In Figs. 1 and 2, the end unit of the row is designated generally by numeral 10, and the adjacent fragmentarily illustrated unit at 11, the two being positioned end to end at a convenient spacing. In the form of the invention shown in Fig. 1, the frame of each unit has four legs 12, here in the form of angle irons resting on flooring 13, and welded or otherwise secured at the top to end walls 14 of the structure. These end walls 14 together with inwardly converging sides 15 and a bottom water-return trough 16 form a drainage tank that receives the wash water and carries it off. For this purpose trough 16 preferably has a sloping bottom, as appears in Fig. 1, and the troughs of adjacent tables are extended and connected as indicated at 17 in Fig. 1, so that the used wash water and soil from the several units of the row flow off via a single, continuous channel. In order to conserve water, this water flowing off by way of the interconnected troughs 16 may be purified, for recirculation through the later described spray pipes of the apparatus; in any suitable or known manner, which need not be detailed herein. The spray-catching tank formed by ends 14 and sides 15 is preferably provided with a top 18 which serves not only to prevent produce from falling within the tank, but also as a convenient stationary table surface. This tank together with the legs 12 form a frame or table structure on which the later described turntables are mounted.

Tank top 18 is formed with one or more, preferably two, circular openings 19, of a diameter approximately or nearly equal to the width of the stationary table surface afforded by the tank top 18. These circular openings 19 are spaced longitudinally of the tank top, and at comparatively close spacing, as illustrated in Fig. 2.

Foraminous turntables 20 are mounted in circular openings 19, each embodying a central hub 21 mounted on a vertical drive shaft 22, radial spokes 23, and a rim 24, together with a suitable open mesh produce supporting member 25 mounted on spokes 23 and fastened in any suitable manner to hub 21 and to rim 24. The detailed construction of this foraminous or open mesh turntable is of course subject to considerable modification, the purpose in this form of the invention being to provide an open mesh or uniformly perforate turntable substantially filling the circular opening in the tank top, which will permit wash water to drain readily therethrough into the tank, and which is of sufficiently open mesh that spray devices positioned below the turntable will be capable of forcing wash water upwardly therethrough to effectively wash the undersides of the produce on the turntable. It will be understood that although we refer to a "tank," it is not to be implied that that element is intended to hold a body of water; it is only intended as a shell or basin to confine and catch the wash water passing through or dropping from the tables, directing the wash water into the drainage trough.

In the embodiment of the invention here shown, turntable drive shafts 22 are provided at the top with bevel gears 30, which mesh with

bevel gears 31 on a single overhead line shaft 32 extending longitudinally of the units 10, 11, etc., and understood to be driven by any suitable prime mover, not shown. Preferably, the drive gear for the turn table shafts 22 is so arranged that the two turntables for each unit turn in opposite directions; in the embodiment here illustrated, this is accomplished by arranging the bevel gears 31 on line shaft 32 to mesh with opposite sides of bevel gears 30 (see Fig. 1). As here shown, line shaft 32 is journaled in line shaft bearings 33 supported by frame structures 34 erected on the ends of the several wash table units 10, 11, etc. Each of said frame structures 34, as here shown, comprises a pair of angle members 35 extending upwardly and towards one another from an angle brace 36 welded or otherwise secured to the end wall of the tank at its top edge, the members 35 being joined to member 36 as by welding, and a horizontal top angle member 37 welded to the top ends of members 35. The line shaft bearing 33 at the end of the row of units 10, 11, etc. (right-hand end of unit 10 as viewed in Fig. 1), is mounted directly on top of the aforementioned top frame member 37. Between successive units such as 10 and 11, a mounting plate 38 is secured to top frame members 37 of adjacent units, and secured to said plates 38 are the further line shaft bearings 33, in the arrangement clearly illustrated in Fig. 1. This driving arrangement for the several turntable shafts 22 is here described merely as typical; any suitable drive common to the shafts 22 may be used.

The vertical shafts 22 of turntables 20 extend downwardly below the latter within the drainage tank, each being supported at its lower end by a button type step bearing 40 resting on a supporting plate 41. Shaft 22 is surrounded above plate 41 by a comparatively long bearing retainer sleeve 42, secured at the bottom, as by welding, to plate 41, and containing a plurality of anti-friction roller bearings 43 rotatably supporting shaft 22. Sleeve 42 is closed at the top by means of a collar 44, and the rollers 43 rest at the bottom on the rim portion of bearing 40, which just fills sleeve 42, all in the arrangement clearly illustrated in Fig. 3. Water and dirt are thus kept out of the bearings.

The supporting plate 41 for bearing 40 and sleeve 42 is secured, as by screws 48, to a plate 49 welded to the top side of a water supply pipe 50 which extends longitudinally of the drainage tank just above water return trough 16. The water supply pipes 50 of the several units 10, 11, etc., extend through and are supported by opposite end walls 14 of the tank, and are coupled between the units as by means of T-fittings 51 (Fig. 1).

Coupled to the projecting end of water supply pipe 50, at the right hand end of unit 10, as viewed in Fig. 1, is a riser 52, from which lead a pair of horizontal water spray pipes 53 and 54, disposed below and above turn-table 20, and located substantially in the longitudinal medial plane of the unit. The lower pipe 53 is located immediately below the plane of the turntable, whereas the upper pipe 54 is located sufficiently above the plane of the turntable to provide clearance for the produce carried thereon. The two pipes 53 and 54 are capped at the ends as indicated at 55, and are equipped with longitudinally spaced water spray jets 56, directed toward the turn table, which may be of the nature shown in Fig. 5. As shown in Fig. 5 each such jet

may typically consist of a nipple 57 screwed into the spray pipe, and provided with a longitudinal discharge passageway 59 discharging against a flat deflector surface 60, of such a nature as to cause the water to be forcibly ejected in a flat stream. The flat streams ejected by the several jets form a vertical curtain of wash water through which the produce on the turntable must travel. One or more rows of the jets may be used in each spray pipe.

A riser 52 similar to riser 52 extends upwardly from the T-fitting 51 in water supply pipe 50 between adjacent units, and supplies pairs of water spray pipes 53 and 54, extending in opposite directions into both units 10 and 11, in the arrangement illustrated in Fig. 1. Thus the two turntables of each unit are equipped with a pair of water spray pipes, one above and one below the turntable, extending inwardly from the two ends of the unit; in instances of two units placed end to end, a single riser from water supply pipe 50 is made to serve the water spray devices at the proximate ends of the two units.

Mounted on each turntable is a vertical cylinder 65, having cylindrical side walls 66 and preferably a top 67, but preferably open at the bottom, top 67 being centrally perforated for the turntable drive shaft 22, as illustrated in Fig. 3. The cylinder is secured to its turntable and rotates with it. A hood 70 is arranged over each of the upper spray pipes 54, in order to prevent splashing of spray water. This spray confining hood, around the curtains of wash water, is preferable but not necessary. As here illustrated, the hood comprises a horizontal sheet metal top 71, at one end overlying the upper end of cylinder 65, and provided at its opposite end with a vertical back wall 72 secured at its lower edge, as by spot welding, to the upper edge of the end wall 14 of the drainage tank, or to the table top 18. The end of top 71 which overlies cylinder 65 may either rest on it or may be supported from the upper shelf 80, hereinafter described. That end of top 71 may serve as a top closure for cylinder 65 if the cylinder has no top wall. As here illustrated, the top 71 of hood 70 is of semi-circular shape at its forward end, conforming to cylinder 65, and may extend on one side of the machine (the packer's side) from cylinder 65 toward end wall 72 in a direction substantially parallel to the longitudinal center line of the machine, while on the other side (the trimmer's side) it preferably extends toward rear wall 72 in an outwardly angled direction, as illustrated in Fig. 3a. The two side edges of top 71 are provided with downturned flanges 73, to which are secured, in any suitable manner, fabric or any suitable flexible drop curtains 75, vertically split at close intervals, as indicated at 76, in order to permit ready passage of the produce. As illustrated in Fig. 3, these drop curtains 75 hang preferably to a level just above turntables 20, while the flanges 73 supporting their upper ends are located sufficiently high above the turntables to afford clearance for the produce. Thus the hood 70, with its drop curtains 75, together with the cylinder 65, effectively enclose the water spray area, and prevents splashing of the spray water, though the split curtains permit free passage of the produce. The angular disposition of the curtain 75 on the trimmer's side of the table affords a sufficient opportunity for the produce to move clear of it and for the curtain to drop before the produce reaches the plane of the water sprays. The purpose of the cylinders 65 is to space the

produce on the turntables away from the central shaft far enough to insure a good length of produce-travel through the curtained spray zone. Incidentally, the cylinders also keep spray water away from the turntable shaft and hub and thus aid somewhat in preventing water running down the shaft and getting into the bearings below. To perform these functions the cylinders can either be stationary, or rotate with the turntables; the latter being preferred.

Preferably, a produce storage pan or shelf 80, extending the length of the machine, is mounted above the two hoods 70, supported by the end framing, in the manner clearly illustrated in Figs. 1 and 3.

Secured to the side of the frame along which the trimmers are to stand is a pair of chutes 82 for reception of trimmings and culls, these being preferably positioned conveniently opposite the two turntables, and their lower ends discharging into a trough or channel 83 sunk in flooring 13 and extending longitudinally of the row of machines. The refuse so discharged into trough 83 may be carried away by any suitable type of endless conveyer, as indicated at 84 in Fig. 3, or by water circulation.

Fig. 6 shows in diagram a floor plan of a double turntable produce washing machine unit such as has been described. Four trimmers stand along one side of the unit in the positions designated at T, facing the chutes 82, and a single packer stands on the other side of the unit, between the two turntables, in the position designated at P, it being found in practice that one packer can handle the output from four or more trimmers. Field boxes containing lettuce or other similar produce are carried to and deposited alongside the trimmer's side of the unit, adjacent the cull chutes 82, against guard bars 15a, as indicated at B. Packing crates C are placed alongside the table on the packer's side, one on each side of the packer, and in back of the packer is the box or chute 1 filled with the supply of packing ice.

The trimmers take the lettuce from the boxes B, trim it, and deposit it on the two turntables, one of which is in convenient reach of each trimmer. The trimmings are dropped in the cull chutes 82, which are between the two trimmers feeding produce onto each of the two turntables. The two turntables, turning in opposite directions, as indicated by the arrows, at preferably about 2 R. P. M., carry the produce so deposited on them under the hoods 70 where it is sprayed with a curtain of wash water, which not only comes down from the spray pipes above, but also, in the form being described upwardly through the open mesh turntables from the spray pipes below. The refuse water drains from the produce through the open mesh turntables into the drainage tank, and is carried off by way of trough 16. The produce having first passed through the curtain of spray water, then moves onwardly to the packer's side of the unit, and may then be removed by the packer, sorted, and placed in the two packing crates C. The packer will ordinarily sort the lettuce into two sizes, to go into the two crates C, packing layers of ice in the crates between layers of lettuce. Odd sizes he may temporarily deposit in the long shallow storage pan 80 above the turntables, to be removed and packed in special crates at a later time. If the packer should miss some of the produce on its first trip around, it will simply travel around with the turntable, take an-

other trip through the water spray, and come back to him again. If he notices that any of the produce is not thoroughly washed, he may simply allow it to take an additional trip through the water spray, or as many trips as may be necessary to clean it properly for packing. As previously mentioned, one packer can just about keep pace with four trimmers; the machine is thus designed for efficient operation by a squad of five operators—four trimmers and one packer.

Inspection of Fig. 6 will reveal that the washing machine of the present invention occupies no more floor space than would an ordinary wash table. The machine has the advantage of greatly increased efficiency in transporting the produce from the hands of the trimmers to the hands of the packer, and the further advantage that neither the trimmers nor packer need work in or reach under the sprays. All the produce is transported first under the washing spray and then directly to and in front of the packer. No produce reaches the packer without being washed, and all of it on both turntables is concentrated on his position. These advantages in operation flow from the facts that the two turntables of the pair constituting the unit are rotating in mutually opposite directions and that the sprays are located over those sides of the turntables which are moving in the direction away from the trimmers' side toward the packer's side. In the particular opposite directions of rotation shown in Fig. 6 (which are the preferred opposing rotative directions) it is the mutually remote sides of the turntables—those adjacent the ends of the unit frame—which are moving from the trimmers' to the packer's side. Consequently, with those preferred rotative directions, the sprays are located over those remote sides of the tables, rather than over the mutually adjacent turntable sides, near the center of the frame, which are moving from the packer's to the trimmers' side of the frame.

Another advantage which applies to all the described forms of the invention, over a long washing table or travelling belt, is that the trimmers' work rests directly opposite them on a certain turntable and goes only to a certain packer. The arrangement greatly facilitates supervision of the trimmers' work, as the supervisor can definitely locate the production of each pair of trimmers. And the arrangement also gives to each packer an average pack; he cannot pick and choose from a large amount of produce on a table or belt before him.

Fig. 7 is a view similar to Fig. 1, but showing a modification in which each of the shafts 22 is equipped with a pair of vertically spaced foraminous turntables. It will be understood that corresponding parts of the machines of Figs. 1 and 7 are identified by corresponding reference numerals, and a description of like parts and features will be unnecessary. It is sufficient to point out that each of the turntable shafts 22 is equipped not only with the lower turntable 20, which may be exactly like the turntable 20 of the previously described form of the invention, but also with a second turntable 90, spaced above turntable 20 and above the upper spray pipe 54 for turntable 20. In this instance, of course, an additional spray pipe 91 is employed, spaced properly above upper turntable 90, and a hood 92 is provided for the purpose of enclosing the spray area about the spray pipe 91. The spray pipe 54 is provided with upwardly directed jets 56 as well as the previously described downwardly

directed jets 56, as illustrated, so that the produce on both of the turntables is sprayed from below as well as from above. The provision of this double-deck type of turntable arrangement has several advantages; first, it of course provides for additional capacity, and second, it enables the trimmers to sort the produce preliminarily, so that the packer may receive produce of one general size or quality on one turntable, and produce of another general size or quality on the other turntable. Or the packer may use the upper turntables, or one of them, for temporary deposit of odd sizes.

The form of wash unit shown in Figs. 8-10 is similar in function and operation to the form shown in Figs. 1-3. In addition to embodying a different type of drive, which in certain respects is preferred over the previously described over-head type, it also embodies certain refinements and simplifications in structure that materially decrease the cost of manufacture and assembly. The unit may readily be assembled and disassembled for transportation in knock-down condition.

Figs. 8 and 13 show an end unit 10a and an adjacent intermediate unit 11a, it being understood that any number of intermediate units 11a may be placed end to end to form a row of such units and that the unit at the opposite end of the row will be similar to unit 10a. Units 10a and 11a, however, are similar in every respect except for minor differences such as spray-pipe connections, etc., as will be described.

Each unit embodies a frame comprised of two pairs of legs 100 of angle iron, each pair being connected by angle iron cross members 101, 102 and 103 suitably attached thereto as by bolts 104. Longitudinal rail members 105 are bolted at 106 (Fig. 10) to the projecting ends of cross members 103. Supply pipe 107, in this instance, is utilized as a structural member of the frame and serves as a longitudinal member connecting cross members 101, plates 108, welded to pipe 107 and bolted at 109 to members 101, providing the connection. The frame is longitudinally braced by diagonal struts 110 which are bolted, at their upper ends, to cross members 103 and at their lower ends, to upstanding lugs 111 welded to pipe 107. Adjoining units may be connected by straps 112 suitably bolted to cross members 103.

The turn tables, indicated at 115, are in the form of inverted, truncated cones 116, the upper ends of which receive produce-supporting members 117, later to be described. Perforated plates 118 span the lower openings of the cone and are suitably secured to the cone members as by welding. Projecting downwardly from the centers of plates 118, and welded thereto, are pivot pins or shafts 119 that are mounted for rotation in tubular step-bearing members 120 welded to pipes 107. These bearing members are essentially the same as those described in connection with Figs. 1-3, so no further description will be necessary.

Turntables 115, thus mounted for rotation, are driven by an endless chain 122 passing over ring sprockets 123 (centrally apertured) which are bolted at 124 to the under side of plates 118. As shown in Figs. 9 and 13, chain 122 passes around one side of one sprocket and thence around the opposite side of the next successive sprocket. At one end of the row of units, the chain passes around a suitably supported return sprocket 124 (Fig. 13) and thence longitudinally of the row

of units to the other end where it passes around another similarly mounted return sprocket (not shown), thence passing around sprockets 123 as above described. It is obvious that one of the return sprockets, as for instance sprocket 124, may be driven by a prime mover (not shown) and that the other end sprocket would then be an idler. In this manner the turntables of each unit are rotated in opposite directions; and, with chain 122 travelling in the direction indicated by arrows in Figs. 9 and 13, that the rotation of the turntables will be away from the center of each unit on the trimmers side and toward the center of the packers side, attention being called to the fact that Fig. 8 is viewed from the trimmers side of the machine while Fig. 1 is viewed from the packers side.

Chain 122 is preferably supported along its circuitous path by suitable supporting rails such as indicated at 135, 137, 137' and 139. Rails 135, carried by posts 136 extending upright from supply pipes 107, support the chain between the two sprockets of each unit. Rails 137, suitably secured (as by screws) to adjacent cross members 102, support the chain as it passes from the sprocket of one unit to the next successive sprocket of the adjacent unit. The lengths of chain between the outer end sprockets of end units 10a and return sprockets 124 are supported by rails 137' mounted on cross members 102. Along its return path (between return sprockets 124), the chain is supported by rails 139 that extend along the full length of each unit, rails 139 being supported and suitably secured (as by screws) to cross members 102. All of the rails may be of channel iron, and the ends of each are preferably flared, as indicated in the drawings.

Each of the produce-supporting members 117, above referred to, and here shown as uniformly foraminous or perforate, is preferably made up of two sections, a fixed section 117a and a removable section 117b (see Figs. 10 and 11). Section 117a is formed of an outer semicircular member 126 and an inner circular member 127, the two members being connected by radial rods or spokes 128 fastened thereto as by welding. If desired, section 117a may be welded or otherwise secured to the turntable. Section 117b is formed of inner and outer semicircular members 130 and 131, respectively, which are connected by radial spokes 132. A suitable open mesh or foraminous produce-supporting material 133 covers each of sections 117a and 117b. Section 117b may be separated from section 117a (as indicated in Fig. 11) and removed in order to provide access to the interior of the turntable, the purpose of which will later appear. Mounted (as by welding) on circular member 127 of section 117a is a vertical cylinder 140 having a cylindrical side wall 141 and top wall 142 centrally apertured at 143. This cylinder corresponds to cylinder 65 above referred to in connection with Figs. 1-3.

The supply pipes 107 of each unit are connected by suitable couplings 145, and extending upwardly from these couplings are risers 146. The upper ends of the risers are provided with T fittings 147 to which are connected branch pipes 148 extending oppositely and longitudinally over adjacent turntables 115 at the adjacent ends of adjoining units. Connected by L-fittings 149 to the outer ends of branch pipes 148 are vertical branch pipes 150 that extend downwardly and axially through cylinder 140 freely passing

through openings 143 in top walls 142. The lower ends of branch pipes 150 are provided with L-fittings 151 to which are connected branch pipes 152, the latter extending horizontally beneath and parallel to branch pipe 148 and directly beneath the foraminous produce-supporting surface 117 of the turntables. The free ends of branch pipes 152 are suitably plugged. Branch pipes 148 and 152 are provided with spray jets 153 directed toward the produce-supporting surfaces, the jets being of the form shown in Fig. 5.

The outer ends of supply pipes 107 of units 10a are provided with fittings 145', one of these fittings serving as a coupling to couple pipes 107 with a source of water supply, as indicated at 154, and the other fitting (not shown) serving as a cap. Risers 146', connected to these fittings, are provided at their upper ends with L-fittings 147' to which are connected branch pipes 148', 150' and 152', similar to the above described branch pipes.

Arranged over each of the upper horizontal branch pipes 148-148' is a hood 160 made of sheet metal and comprising an end wall 161 and a top wall 162. End wall 161 is flanged along its vertical edges for stiffening purposes and is provided at its lower edge with a foot portion 163 by means of which it is suitably secured, as by bolting, to cross member 103 of the frame. Near its upper edge, end wall 161 is apertured at 164 to pass branch pipe 148 (or 148'). The side edges of top wall 162, which extends over branch pipe 148, are upwardly flanged at 165, these flanged edges lying in vertical planes substantially tangent to vertical cylinder 140. Continuing downwardly from the free end of top wall 162 is a vertical end wall 166 that is apertured at 167 to receive the free end of branch pipe 148. Welded to the lower edge of end wall 166 and arranged immediately above top wall 142 of cylinder 140 is a horizontal plate 168 that is centrally apertured at 169 to closely receive the upper end of vertical branch pipe 150, plate 168 serving as a cover for the upper end of cylinder 140.

From an inspection of the hood structure thus far described, it will be seen that end wall 161, encircling branch pipe 148, supports the upper end of riser 146 (and the branch pipes connected thereto) against displacement transversely of the machine. Likewise it will be seen that the riser and connected branch pipes are held against displacement longitudinally of the machine by the engagement of plate 168 with vertical branch pipe 150. The free end of the hood structure is preferably supported by branch pipe 148 engaging end wall 166 in order that plate 168 may be spaced slightly above top wall 142 of cylinder 140 and accordingly may not act to retard free rotation of the associated turntable.

Flexible drop curtains 170, suitably slit as described in connection with the form shown in Figs. 1 to 3, are arranged to engage and depend from flanges 165 of top wall 162 of the hood. The lower edges of the curtains hang at a level just above the produce supporting surface, and the curtains thus confine the water that splashes from the produce as it passes between spray jets 153. The curtains are arranged in plan in the same relative placement as has been described in connection with Fig. 2.

Water that drains from the produce and the foraminous produce supporting surfaces drops into cone shaped pans 116 of the turntables and drains therefrom through the perforations in

plates 118 and the central openings in ring sprockets 123. Circular screen members 118a are preferably placed over the perforations in plates 118 for the purpose of catching any produce material that might pass through the foraminous produce supporting members. Positioned directly beneath plates 118 and sprockets 123 and suitably supported by bearing members 120 are drain pans 170 that drain laterally into a drain trough 171 extending the full length of the row of units and suitably supported by cross members 101, blocks 172 being interposed between trough 171 and cross members to properly slope the trough. Any water that may splash over the peripheral edges of the turntables, within the confines of hoods 160, is caught by sloping drain troughs 173 which are mounted at 174 on end walls 161 of the hoods and which are of a width, at their upper ends, substantially equal to the width of the end walls. Drain troughs 173 taper downwardly and empty into pans 170.

The form of cull chute shown in Fig. 10 is somewhat simpler in construction than the form shown in Figs. 2 and 3. The cull chute 180 (Fig. 10) comprises a sloping trough shaped member provided with hook shaped arms 181 secured to the side walls 182 of the chute. Arms 181 merely hook over rail 105 and thus support the chute. A counterweight 183 is fastened to the chute near its lower end (and to the right of rail 105 as viewed in Fig. 10) so as to maintain the chute in an upright position with its lower end in engagement with the floor. Thus, the chute may conveniently be slid along rail 105 to any desired position, or it may be pushed inwardly toward the wash unit whenever such movement is desired.

The variational form of turntable shown in Fig. 12, which may be preferred for the washing of certain kinds of produce, is similar to the form shown in Figs. 8-10 with the exception that the produce supporting surface is non-foraminous. As shown in this form, the tables need not be foraminous or perforate, as the water may flow off over their surfaces. Instead, a circular sheet-metal, produce supporting platform 185 is mounted within cone-shaped pan 116 and is slightly dished to provide for drainage. Vertical cylinder 140' is mounted over the central opening 186 in the platform and is perforated or notched at 187 at its lower end to pass the water that drains from the platform. When using this form of turn-table, branch pipes 150 and 151, and screen 118a are removed from the unit, and branch pipes 148, only, are used for washing the produce.

We have now described certain specific means for carrying our invention into practical effect; it is to be understood, however, that this is for illustrative purposes only and that various changes in design, structure and arrangement may be made without departing from the spirit and scope of the invention or of the appended claims.

We claim:

1. In a produce washing machine, the combination of an elongate frame having one side accommodating trimmers and an opposite side accommodating a packer, a pair of turntables mounted to rotate about vertical axes on the frame and longitudinally spaced from each other, the turntables being rotatable in a substantially common horizontal plane, means for rotating the turntables in mutually opposite directions such that the peripheral movements of the two turntables at the packer's side of the frame are toward each other and toward the center of the frame, and means creating a curtain of spray for each turntable extending radially of the tables from their central portions outwardly in opposite directions toward the ends of the frame.

2. In a produce washing machine, the combination of an elongate frame having one side accommodating trimmers and an opposite side accommodating a packer, a pair of turntables mounted to rotate about vertical axes on the frame and longitudinally spaced from each other, the turntables being rotatable in a substantially common horizontal plane, means for rotating the turntables in mutually opposite directions such that the peripheral movements of the two turntables at the packer's side of the frame are toward each other and toward the center of the frame, and means creating a curtain of spray for each turntable extending radially of the tables from their central portions outwardly in opposite directions toward the ends of the frame; each said rotatable turntable comprising a perforate produce-carrying top and a lower conical drainage basin.

3. In a produce washing machine, the combination of an elongate frame having a side accommodating trimmers and an opposite side accommodating a packer, a pair of turntables mounted to rotate about vertical axes on the frame and longitudinally spaced from each other, the turntables being rotatable in a substantially common horizontal plane, means for rotating the two turntables in mutually opposite directions so that peripheral movements of the adjacent sides of the two turntables at the center of the frame are in a direction from one side of the frame toward the other side of the frame, and peripheral movements of the relatively remote sides of the two turntables adjacent the ends of the frame are in directions from the said other frame side toward the said one frame side, and means creating a curtain of spray for each turntable extending radially of the tables from their central portions outwardly in opposite directions toward those sides of the turntables which move in the direction from the trimmers' frame-side to the packer's frame-side; all so that all produce deposited upon the two turntables at the trimmers' side must pass through the sprays before being carried by turntable rotation to the packer's side of the frame.

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