June 30, 1931. W. DE BACK 1,811,908

COMBINED DRAINER AND SIRUPER

Filed June 11, 1928 3 Sheets-Sheet 1

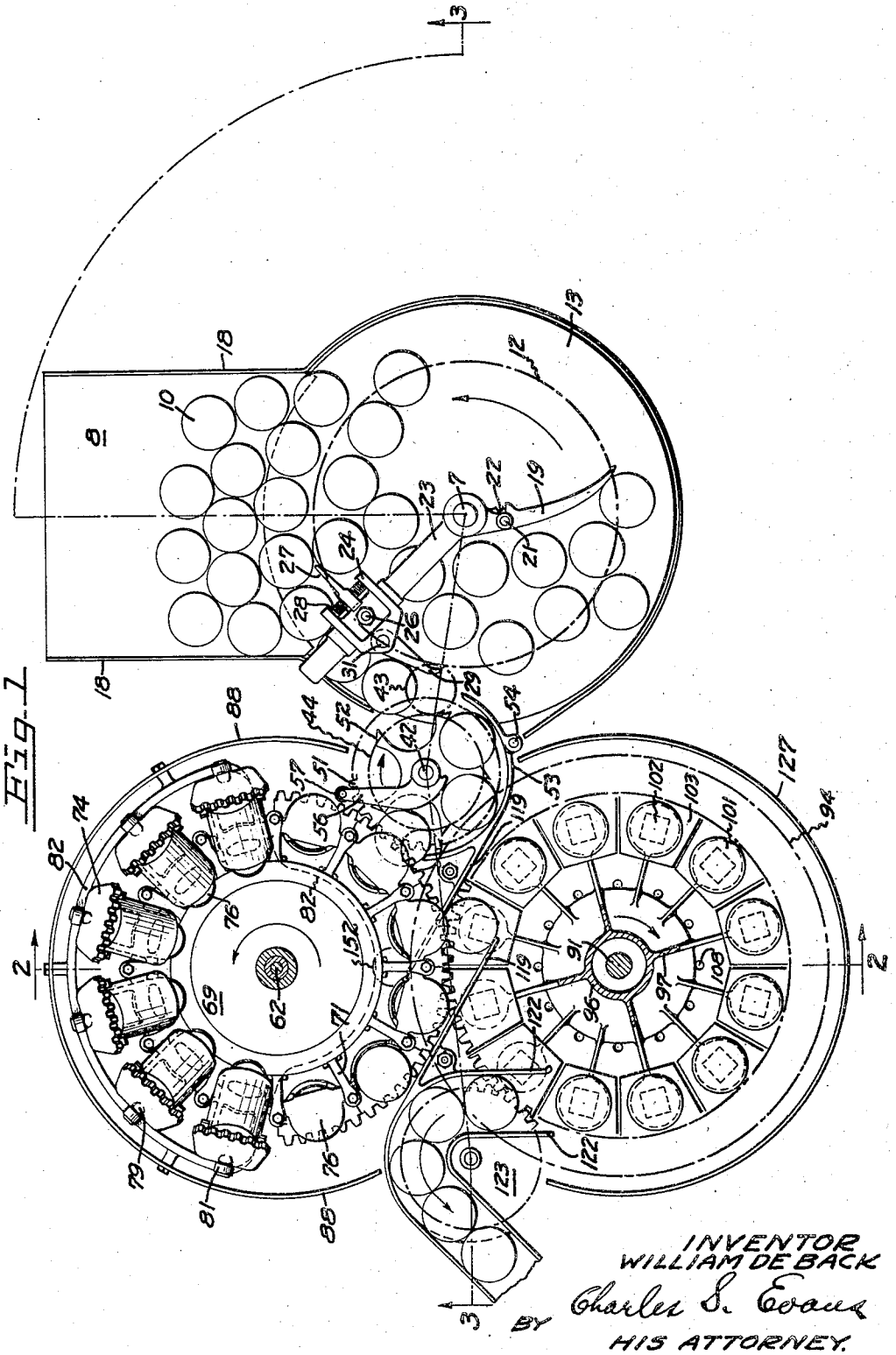


Fig. 1

INVENTOR
WILLIAM DE BACK
BY Charles S. Evans
HIS ATTORNEY.

June 30, 1931. W. DE BACK 1,811,908

COMBINED DRAINER AND SIRUPER

Filed June 11, 1928 3 Sheets-Sheet 2

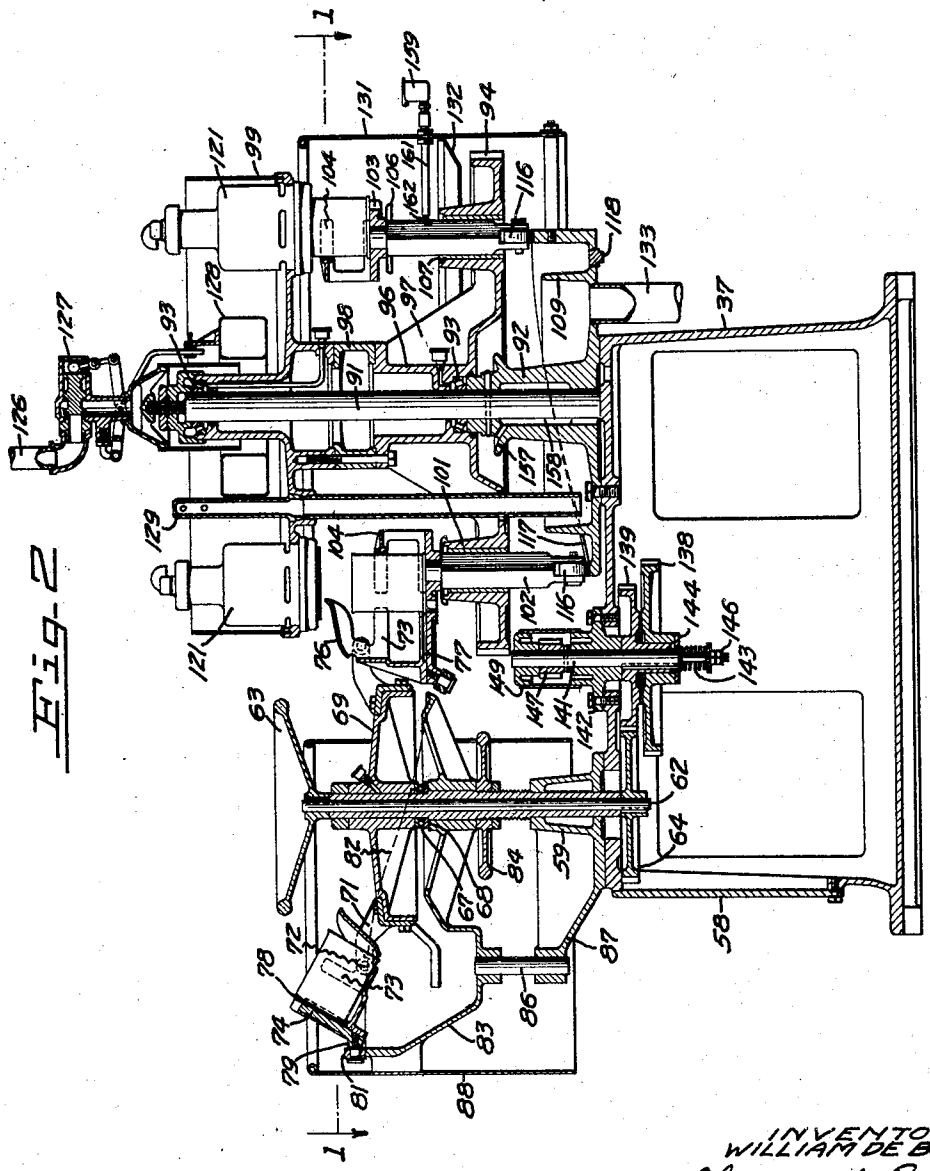


Fig-2

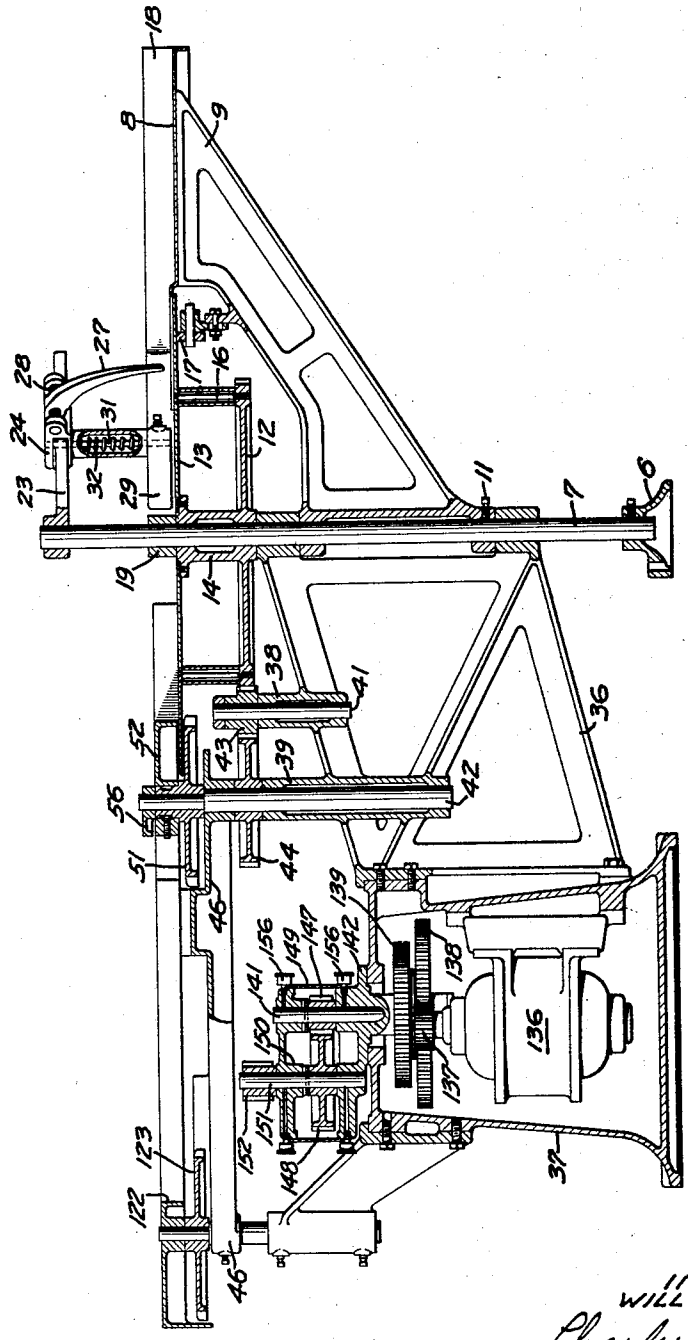
INVENTOR
WILLIAM DE BACK
BY Charles A. Evans
HIS ATTORNEY.

June 30, 1931. W. DE BACK 1,811,908

COMBINED DRAINER AND SIRUPER

Filed June 11, 1928 3 Sheets-Sheet 3

Fig. 3



INVENTOR
WILLIAM DE BACK
BY Charles S. Evans
HIS ATTORNEY.

Patented June 30, 1931

1,811,908

UNITED STATES PATENT OFFICE

WILLIAM DE BACK, OF SAN LEANDRO, CALIFORNIA, ASSIGNOR TO SPRAGUE-SELLS CORPORATION, OF HOOPESTON, ILLINOIS, A CORPORATION OF DELAWARE

COMBINED DRAINER AND SIRUPER

Application filed June 11, 1928. Serial No. 284,539.

My invention relates to canning machinery, and particularly to machinery for packing fruits and berries.

An object of my invention is to produce a drainer and siruper in a single unit, in order to conserve floor space and attendance.

Another object of my invention is to produce a machine which receives and delivers its product substantially in the same plane.

Another object of my invention is to provide a machine to which the cans to be treated may be delivered in groups or at random and which will automatically and rapidly feed them through in regularly spaced sequence.

Another object is to provide a machine of the character described which will maintain the separation of the various liquids, and will return accidentally spilled sirup uncontaminated by drainage or by oil from the running parts.

Another object of my invention is to provide a machine which will prevent jamming and consequent damage of cans passing through it.

A further object of my invention is to provide a machine of the character described which is self contained, and which may be cleaned and sterilized without damage to the motor or other parts.

Still another object is to provide a machine of the character described which may safely be operated by low grade or careless workers, as all gears and moving parts are protected by guards.

My invention possesses other objects and valuable features, some of which will be set forth in the following description of my invention which is illustrated in the drawings forming part of the specification. It is to be understood that I do not limit myself to the showing made by the said description and drawings, as I may adopt varying forms of my invention within the scope of the claims.

In the process of canning many fruits and berries, the fruits are handled in water up to the time that they are placed in the cans. This is done both to wash the products and to prevent injury by bruising or crushing.

A considerable volume of water clings to the fruit, especially where, as in the case of raspberries or peaches, there are cavities in which the water can collect.

Fruits of this character are cooked in sirup, and to prevent its dilution by an indeterminate amount of water, the cans must be drained before the sirup is introduced. Each can must therefore be inverted; allowed to drain for a few seconds, righted, and fed into a siruper where a definite amount of sirup is admitted.

One of the chief problems in a canning plant is to keep the can line moving rapidly and without interruption. At every point where its rate of flow changes there is opportunity for jamming and stoppage, and this is especially likely to occur where it must change from one plane of travel to another.

With these facts in view it is obviously advantageous to consolidate two machines into one, especially as canning machinery is necessarily bulky and space is at a premium. This has not been done heretofore with the drainer and siruper because most of the drainer mechanisms received and discharged on different levels, and the feeds could not conveniently be synchronized. My device meets these difficulties and performs the functions of siruper and drainer in little more space than was formerly needed for one machine, and with but little more than half the liability of interruption.

Referring to the drawings:

Figure 1 is a sectional view in plan of my combined drainer and siruper, the plane of section being shown by the line 1—1 of Fig. 2.

Figure 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Figure 3 shows a compound vertical section on the line 3—3 of Fig. 1. In this view are shown the disk feed, timer and discharge transfer disk, the drainer mechanism being omitted.

Broadly stated my invention comprises a horizontal rotating disk onto which cans are fed at random. Spring actuated guides above the disk force the cans onto its periphery, from which they pass to a timer, which deposits the cans at uniformly spaced inter-

vals onto the can turrets of the drainer, to which the timer is geared.

The drainer comprises a turret wheel mounted for horizontal rotation. Pivotally supported around this wheel are the can turrets. The floors of the turrets are sectors of an annulus, and in the rim of the annulus are formed the teeth with which the timer is geared. The points of support are such that the turrets normally hang against the central part of the wheel to form a continuous ring gear. They may, however, be swung outwardly through an angle of 120 degrees or more to invert the cans and drain the contents. When this is done the can is held in position by a nest on the turret which engages the seam on the bottom of the can, and a retainer extending over the can as it rests in the turret holds the solid contents in place. As the drainer rotates the turrets are successively inverted in this manner by a cam formed in the rim of a bowl mounted below the turrets and into which the cans drain.

After draining, the turrets return to normal position, and the cans are then transferred by guides onto the siruper turrets with which the drainer turrets mesh.

The siruper also comprises a horizontally rotary wheel. On the wheel the turrets are mounted to slide vertically. The floors of the siruper turrets are also annular sectors of equal circular pitch with the drainer turrets, and with gear teeth formed in the periphery to engage therewith. Above the turrets the siruper wheel carries a sirup bowl with a filling valve located above and in register with each turret. As the sirupter rotates a stationary cam raises each turret to bring the can thereon into engagement with its filling valve, after which they drop back into their initial plane, where guides direct the cans to a transfer disk which discharges them from the machine.

The base of the machine contains the motor and driving gears, and is splash proof, so that cleaning the machine by steam or water hose will not injure these parts. A hand wheel is provided for moving the parts independently of the motor. A frictional drive is employed to prevent wrecking the machine if the gears jam through improper handling.

Separate channels are provided for the drainage from the cans, for sirup accidentally spilled owing to a defective can or other cause, and for lubricant escaping from the bearings.

Describing a preferred embodiment of my invention in greater detail, a foot 6 supports a vertical rod 7 on which the receiving table 8 is carried by the bracket 9. The receiving table may be swung around the rod to allow the cans 10 to be fed from the most convenient angle, and locked in the desired position on the rod by the set screw 11. Journaled on the rod is the large spur gear 12, to which the feed disk 13 is attached by means of the hub 14 and the tie bolts 16. The rim of the feed disk under-runs the edge of the receiving table; and a part of the load on the disk at this point is supported by a roller 17 which is adjustably mounted on the bracket 9. Guard rails 18 around the feed disk and at the sides of the receiving table keep the cans from being forced off and falling to the floor.

Immediately above the feed disk a recurved guide arm 19 is mounted on the rod 7, extending nearly across the disk. The arm has a hinge joint 21 near its point of attachment to the rod. A spring 22 holds the guide arm normally extended, so that when the feed disk is rotated and cans are pushed onto it from the receiving table, the guide arm directs them to the periphery of the disk. Should the cans be fed too rapidly, however, so that they tend to jam, the arm will give and allow the cans to pass, springing back to its normal position as soon as the obstruction clears. This arrangement is of value in preventing damage to the cans.

Arranged on the rod 7 at such a height that the cans on the feed disk may pass under it, is a cantilever arm 23 which carries guides for directing the cans onto a timer which feeds them into the machine at regularly spaced intervals. A yoke 24, radially adjustable on the arm 23 and held in place by a bolt 26, carries a selector guide 27 which curves downward in the direction from which the cans approach. The immediate mounting of the selector guide is the screw 28, parallel to the arm 23, and by adjusting this screw the position of the selector guide may be so adjusted that it switches the cans striking it either to the extreme edge of the disk or toward the center. Cans taking the latter path are picked up by the guide arm 19 and moved to the rim to enter the timer at the next revolution of the disk; those taking the former path enter the timer directly.

Feeding the cans into the timer is accomplished by the guide 29, which is an L-shaped member extending downward from the yoke 24 and arranged for pivotal movement about a vertical fixed shaft 31 passing through the hollow stem of the L. A coil spring 32 surrounds this shaft and urges the foot of the L toward the rim of the disk. Cans on the rim press the guide back against the spring pressure until they have moved past the end of the guard rail 18, where the spring acts to force them onto the timer.

The mechanism thus far described is joined to the main part of the machine by a trussed web 36 connecting the rod 7 with the base 37. The web carries supports 38 and 39 for the vertical fixed shafts 41 and 42. The shaft 41 carries a spur pinion 43 meshing with and driving the gear 12 of the feed disk; the pinion, in turn, is driven by the gear 44 journaled on the shaft 42. Above this gear the shaft

supports the alining plate 46, above which it is reduced in diameter for journaling the timer.

The timer comprises a geared disk 51 which under-runs the edge of the feed disk 13 and with which the spider 52 is fixed for rotation. The arms of the spider form a plurality of equally spaced can stations, each semicircular in general form; and the tips of the spider arms are sloped backward as shown to facilitate the entry of the cans into the stations. A guard rail 53 partially surrounds the edge of the timer, the end projecting over the feed disk being mounted on a spring hinge 54 to help in seating the cans and to prevent jamming. A curved guide 56, fixed on the shaft 42 above the spider, ejects the cans from their stations and onto the drainer mechanism as they move past it. A roller 57 is provided on the end of the guide to accomplish the final seating of the cans on the drainer.

The drainer and siruper mechanism are mounted on the base 37. This is preferably a casting, its general contour being that of a rectangular box which encloses the driving mechanism, and access to these parts may be obtained by openings in the sides covered by the plates 58.

On top of the base a bracket 59 supports a vertical housing within which a shaft 62 is journaled. The upper end of the shaft carries a hand wheel 63 and the lower end, within the base, a gear 64. The hand wheel serves to rotate the machine manually, as will later be described in detail.

The upper part of the housing is machined to serve as a fixed shaft on which the moving parts of the drainer mechanism rotate, supported, preferably, by a ball thrust bearing 67 resting on a shoulder 68 formed on the housing. The drianer mechanism comprises a wheel whose central portion is a flat drum 69 having turret brackets 71 uniformly arranged around its circumference. Hanging on trunnions 72 from the brackets are the drainer turrets, each comprising a cradle 73 provided with a bottom 74 on which the can may rest when the turret hangs in its normal vertical position, and a retainer 76 extending over the can. The turret bottoms 74 are sectors of an annular spur gear. The turrets are equal in circular pitch to the can stations of the timer disk 51 with which they mesh and which they drive, i. e. the distance on the pitch circle from a point on one can turret to a corresponding point on the next adjacent turret is equal to the corresponding distance on the can stations of the timer.

Formed adjacent the upper side of the turret bottom, preferably by its juncture with the cradle 73, is a can nest or retainer, which is a groove 77 for engaging the seam 78 around the lower head of the can, and so holding the can in its turret when the turret is inverted.

A lug 79 projects downward and inward from the bottom of the turret, and is provided with a roller 81. The roller engages a cam 82 formed on the rim of the drainer bowl 83.

The bowl is slidaby mounted on the housing 61, resting on a wheel nut 84 threaded onto the housing. The angular position of the bowl is fixed by a pipe 86 which slides in an extension 87 of the housing bracket 59. The pipe 86 also serves as a discharge outlet for the bowl.

The design of the cam on the bowl rim is such that as the drainer wheel revolves the turrets are swung outward on their trunnions through an angle of about 120 degrees. The retainer 76 holds the fruit in the can during this inversion, allowing the water to drain out into the bowl. As the travel continues the cam allows the turrets to drop back to their normal position against the drum so that the gear teeth on the turret bottoms may mesh with the siruper to drive the drainer. A splash guard 88 surrounds the portion of the drainer wheel where the inversion occurs.

The siruper wheel revolves on a vertical shaft 91 supported by a bracket 92 mounted on the base 37. Owing to the weight of the siruper structure, taper roller bearings 93 are provided to minimize friction and carry both the radial and thrust loads.

The frame of the siruper wheel comprises a large disk gear 94 having its hub 96 reinforced with the heavy ribs 97. The hub is surmounted by a spacing ring 98 which carries a sirup bowl 99.

Spaced equally around the web of the gear 94 are bosses 101 each of which has a slideway within which works a square shaft 102 carrying a siruper turret. The siruper turrets are of equal circular pitch with the drainer turrets with which they mesh, and each comprises a sector 103 of an annular gear, and a cradle 104 attached thereto for positioning the cans on the sector. Beneath each of the sectors is a curved splash guard 106 for preventing spilled sirup from running down the shaft 102 and entering the oil groove 107 in the top of the boss. Instead the sirup runs onto the web of the gear 94 and thence drains through holes 108 into a drainage basin formed by a circular wall 109 which surrounds the bracket 92.

Each of the shafts 102 has mounted at its lower end a roller 116, which runs on a circular cam 117 surrounding the wall of the drainage basin. The space between the cam and the basin forms an oil sump which may be drained by removing the plug 118, and which prevents contamination of sirup in the basin by lubricating oil from the shafts 102.

As the siruper revolves the siruper turrets mesh with the drainer turrets and the cans are shifted from the latter to the former by guide rails 119. The cam 117 then raises the turrets to bring the cans into contact with

the siruper valves 121, one of which is arranged in the botom of the siruper bowl 99 in register with each turret. The valves may be of any a number of types, but are preferably of the kind described in my co-pending application, Serial Number 220,332, filed September 19, 1927. These valves admit sirup up to a predetermined level into the can which is pressed against it. After filling, the cam drops the turrets back to their normal level, where the guide rails 122 direct them off of the turrets onto the transfer disk 123 and so out of the machine. The transfer disk is geared to mesh with the turret segments and is driven thereby.

Sirup is fed to the sirup bowl through a pipe 126 and a valve 127 operated by a float 128. To prevent wastage should the valve fail to operate, an overflow pipe 129 is provided, leading directly to the sirup drainage basin.

A splash guard 131 nearly surrounds the siruper wheel, and this guard is provided with a flange 132 projecting inward over the gear 94. Spillage caused by defective cans or otherwise thus falls onto the gear and thence through the holes 108 into the drainage basin. The sirup from the basin is removed through the pipe 133 to be returned to the sirup bowl.

The drive for the machine is taken from a motor 136 mounted vertically within the base 37. A pinion 137 on the motor shaft meshes with a gear 138 which is journaled on the hub of the somewhat smaller gear 139. The latter is keyed to a shaft 141 journaled in a bearing 142 mounted through the top of the base 37. Clutch surfaces are formed on the adjacent faces of the gears 138 and 139, which are pressed together by a coil spring 143 acting against a washer 144 and adjustable by the nuts 146 threaded on the end of the shaft. The gear 139 meshes with the gear 64 which is controlled by the hand wheel 63. By means of the hand wheel it is therefore possible to slip the clutch or to rotate the machine independently of the motor. This feature is important in case of jamming or threatened jamming of the machine.

To the upper end of the shaft 141 is fixed a pinion 147 which meshes with a gear 148. Gear and pinion are both enclosed in a housing 149 carrying the bearings 150 for a shaft 151 on which the gear 148 is mounted, and which also carries a pinion 152 external to the housing. The pinion 152 drives the siruper gear 94, which meshes in turn with the gear 44 of the train driving the feed disk. The siruper turrets, revolving with the gear 94, mesh with and drive the transfer disk 123 and the drainer, and the latter drives the timer as before described.

Compression grease cups 156 provide for the lubrication of the various bearings. Excess grease from these bearings discharges into the base of the machine. In the case of the siruper, where the excess would pass into the sirup basin were not steps taken to prevent it, a flange 157 is provided surrounding the bracket 92 to form a catch channel, from which a passage 158 leads into the base 37. The lubrication of the shafts 102 of the siruper turrets is by an oil cup 159 from which a pipe 161 extends through the splash guard 131 and carries a wick 162. The wick brushes over each of the shafts 102 in turn as they pass it with the turrets in the raised position.

In operation, filled cans are crowded at random onto the feed disk from the receiving table which delivers them to the timer. The timer spaces them at the proper intervals and passes them to the drainer, which inverts them for a few seconds for draining, rights them again, and delivers them to the siruper for filling. They then pass to the transfer disk which discharges them, and they may then pass to an exhauster or other machine for further processing.

The machine will readily drain and sirup cans at the rate of 120 per minute. Should the draining process not be required, the wheel nut 84 may be backed off, dropping the drainer bowl and so disengaging the cam 82. The drainer then acts merely as a feed for the siruper.

I claim:

1. In a canning machine, a rotatable wheel comprising a plurality of turrets for receiving and holding the cans and having gear teeth, and means for supporting said turrets in the plane of rotation during a part of a revolution of the wheel and for moving said turrets in a plane radial of the wheel and out of said plane of rotation during another part of the revolution.

2. In a canning machine, a rotatable wheel comprising a plurality of turrets for receiving and holding the cans and having gear teeth formed thereon for driving the wheel.

3. In a canning machine, a rotatable wheel the periphery of which comprises a plurality of movable sections, gear teeth formed in said periphery, a gear meshing with said teeth, and means for moving said sections out of the plane of said wheel.

4. In a canning machine, a rotatable wheel the periphery of which comprises a plurality of movable sections, gear teeth formed in said periphery, a gear meshing with said teeth, and a cam for moving said sections out of the plane of said wheel.

5. In a can drainer, a rotatable wheel the periphery of which comprises a plurality of pivotally mounted turrets, gear teeth formed on said periphery, a gear meshing with said teeth, and a stationary cam for swinging said turrets out of the plane of said wheel when out of mesh with said gear.

6. In a can drainer, a rotatable wheel the periphery of which comprises a plurality of

pivotally mounted turrets, a drainage bowl beneath the wheel, and a cam, formed on the edge of the bowl, for swinging said turrets out of the plane of the wheel.

7. In a combined drainer and siruper, a drainer wheel, and a siruper wheel geared therewith, the periphery of each comprising a plurality of movable turrets, and a guideway for transferring cans from the drainer turrets to the siruper turrets.

8. In a combined drainer and siruper, a drainer wheel, and a siruper wheel geared therewith, the periphery of each comprising a plurality of movable turrets of equal circular pitch.

9. In a can drainer, a rotatable wheel comprising a plurality of turrets, a plurality of supports projecting above said wheel, said turrets being hung pivotally from said supports and adapted to swing outwardly from the wheel into an inverted position and to seat on the wheel to form a circular periphery, gear teeth formed on said periphery, a driving gear meshing with said teeth, and a cam for inverting said turrets.

10. In a combined drainer and siruper, a drainer wheel, and a siruper wheel geared therewith, the periphery of each comprising a plurality of movable turrets and means for transferring cans from the drainer turrets to the siruper turrets.

11. In a combined drainer and siruper, a rotatably mounted drainer wheel having pivotally mounted turrets circularly disposed thereon, gear teeth formed on said turrets, a rotatably mounted siruper wheel having turrets slidable normal to the plane of rotation circularly disposed thereon and in register with the drainer turrets, gear teeth formed on said siruper turrets meshing with the teeth on said drainer turrets, means for transferring cans from said drainer turrets to the siruper turrets at the meshing position, means for tilting said drainer turrets when out of said position, and means for raising said siruper turrets when out of said position.

12. In a canning machine, a turret wheel, turrets movable on the wheel, a cam engageable with said turrets for moving them from the plane of the wheel, and means for optionally moving said cam into an inoperative position.

13. In a canning machine, a plurality of rotatable wheels, each comprising a plurality of movable turrets for receiving and holding the cans, gear teeth in the periphery of said turrets, said gear teeth being adapted to mesh with each other during a part of the revolution of each wheel, means for moving said turrets from the plane of rotation during another part of the revolution of each wheel, and means for feeding cans onto said wheels including a timer for synchronizing said can movements.

14. In a canning machine, a plurality of rotatable wheels, each comprising a plurality of movable turrets for receiving and holding the cans, gear teeth in the periphery of said turrets, said gear teeth being adapted to mesh with each other during a part of the revolution of each wheel, means for moving said turrets from the plane of rotation during another part of the revolution of each wheel, feed wheels for supplying cans to the turret wheels and geared therewith, and guide means cooperating with said wheels to provide a continuous path for the travel of the cans.

15. In a canning machine, a plurality of rotatable wheels, each comprising a plurality of movable turrets for receiving and holding the cams, gear teeth in the periphery of said turrets, said gear teeth being adapted to mesh with each other during a part of the revolution of each wheel, means for moving said turrets from the plane of rotation during another part of the revolution of each wheel, feed wheels for supplying cans to the turret wheels and geared therewith, guide means cooperating with said wheels to provide a continuous path for the travel of the cans, a source of power for said machine, and means for automatically disconnecting said source of power if the machine jam.

16. In a canning machine, a plurality of rotatable wheels, each comprising a plurality of movable turrets for receiving and holding the cans, gear teeth in the periphery of said turrets, said gear teeth being adapted to mesh with each other during a part of the revolution of each wheel, means for moving said turrets from the plane of rotation during another part of the revolution of each wheel, means for feeding cans onto said wheels including a timer for synchronizing said can movements, a source of power for said machine, and means for automatically disconnecting said source of power if the machine jam.

17. In a canning machine, a rotatable wheel comprising a plurality of turrets for receiving and holding the cans and individually movable with respect to the wheel, and means engaging said turrets for transmitting movement between said wheel and a corelated mechanism.

18. In a canning machine, a rotatable wheel comprising a plurality of turrets for receiving and holding the cans and individually movable with respect to the wheel, and means engaging said turrets for driving said wheel.

In testimony whereof, I have hereunto set my hand.

WILLIAM DE BACK.