Aug. 12, 1924. 1,504,838

E. W. RICKARD

CAN DRAINING MACHINE

Filed June 21, 1923 2 Sheets-Sheet 1

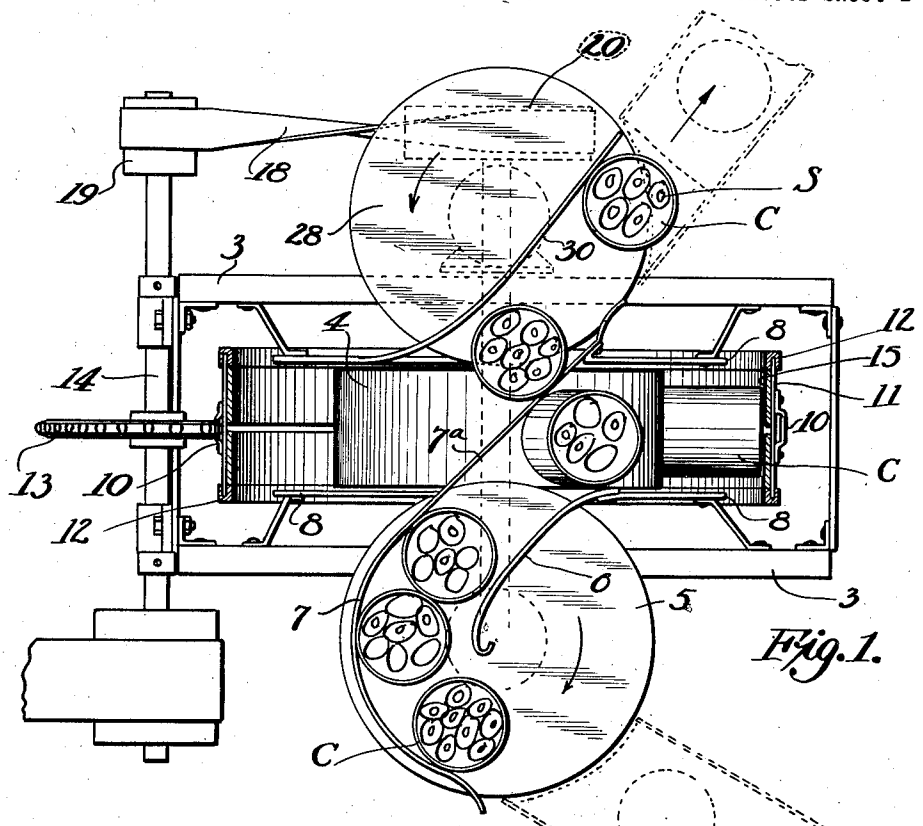
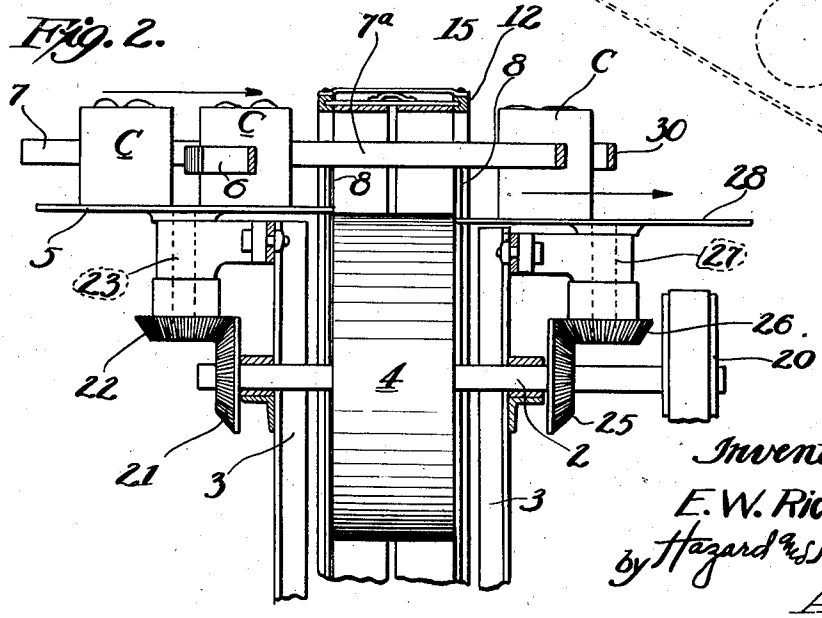


Fig. 1.

Fig. 2.



Inventor
E. W. Rickard
by Hazard & Miller
Att'ys

Aug. 12, 1924. 1,504,838

E. W. RICKARD

CAN DRAINING MACHINE

Filed June 21, 1923 2 Sheets-Sheet 2

Fig. 5.

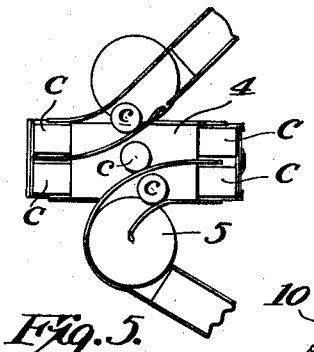


Fig. 3.

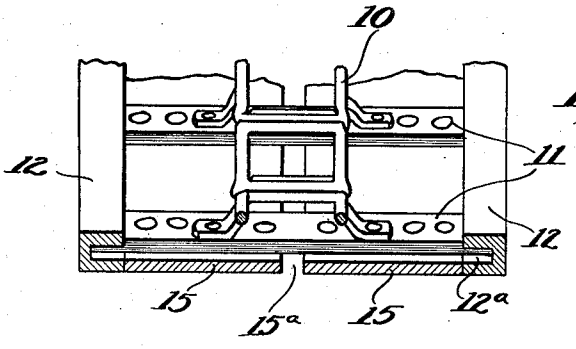


Fig. 4.

Inventor
E. W. Rickard
by Hazard & Miller
Attys

Patented Aug. 12, 1924. 1,504,838

UNITED STATES PATENT OFFICE.

ERNEST W. RICKARD, OF HEMET, CALIFORNIA.

CAN-DRAINING MACHINE.

Application filed June 21, 1923. Serial No. 646,831.

To all whom it may concern:

Be it known that I, ERNEST W. RICKARD, a citizen of the United States, residing at Hemet, in the county of Riverside and State of California, have invented new and useful Improvements in Can-Draining Machines, of which the following is a specification.

This invention relates to canning machines.

An object of the invention is to provide an improvement in machines whereby cans that have been loaded with washed fruit or vegetable pieces, or the whole fruit or vegetable, are inverted so that the wash water may be drained from the cans before they pass on to further steps in the process of treatment. In this present invention, an object is to provide an endless, flexible means adapted to rotate in an orbit around a central means forming a support for the bases or bottoms of the cans, and which support is operatively wholly independent of the endless flexible means, and each of which means is operative to facilitate in carrying the cans in a substantially radial position without spacing devices or timing mechanism of any kind.

An object is to provide an outer, can top engaging and can moving means and an inner, rotary, substantially cylindrical and smooth-faced, central support cooperating with the outer means to receive the cans and hold them in a position as they are carried thereby through an orbit in which the cans are inverted and the liquid drained.

Another object is to provide means for facilitating the introduction of the cans into and from the machine without requirement of timing or can spacing devices.

Other objects and advantages will be made manifest in the following specification of an embodiment of the invention illustrated in the accompanying drawings, wherein:

Figure 1 is a top plan and horizontal section of the machine.

Fig. 2 is a central, vertical section and partial elevation of the upper portion of the machine.

Fig. 3 is a vertical, longitudinal, central section of the machine.

Fig. 4 is a section on line 4—4 of Figure 3, showing a detail of the can transporting belt.

Fig. 5 is a diagrammatic plan showing the machine as adapted for a plurality or rows of cans in one cycle.

The machine is shown as including a central main shaft 2, suitably journaled on any simple and substantial frame, parts of which are designated at 3. On the shaft 2 there is secured a wheel 4, which, for the purposes of the present invention, may be in the form of a simple pulley wheel without spacing lugs, chairs, spokes, arms or other means intended to act as spacing or can guiding or positioning means.

At a suitable position with respect to the center wheel 4, and here shown as to one side thereof, there is provided a simple feed table or disc 5, arranged on an axis substantially perpendicular to the axis of the wheel 4, and clearly shown in Figure 2 as being disposed slightly above and slightly overlapping the top edge of the wheel 4, so that loaded cans C, coming from any source to the feed table 5, can be readily guided off of the top of the table 5 onto the uppermost portion of the wheel 4, as shown in Figure 1, merely by rotation of the turn-table or disc 5 so as to bring the applied cans into a space between guide rails 6 and 7, the latter of which has an arcuate portion concentric to the center of the table 5 and has a tangent portion 7^a directed inwardly and diagonally across and above the top of the wheel 4. The oncoming cans are, in any order of position, singly or in groups, or in rows in which the cans are positioned haphazardly, advanced by the feed table 5, without any timing mechanism, onto the upper portion, in the present case, of the wheel 4, being guided between substantially parallel portions of the guide rails 6—7^a. The diagonal portion 7^a of the rail 7 obviously prevents the inwardly feeding cans from shifting straight across the face of the wheel 4, and the cans coming onto the face of the wheel thus are directed so as to shift from the turn-table 5 with a diagonal movement onto the wheel 4. The cans are loosely confined between circular side guides in the form of flat rings 8, which are so positioned as to lie at about the central portions of the cans between the tops and bottoms thereof.

The cans passing onto the face of the wheel 4 are adapted to be transported around the axis of the wheel in a substantially radial position, and an important object of this invention is to provide a machine in which there is an entirely clear or uninterrupted, circumferential space about the wheel 4 ex-

cepting merely for the diagonal rail section 7^a, which leads the oncoming cans onto the wheel and also has the function of diverting the cans from the wheel as soon as the circuit around the axis of the wheel has been finished.

To that end, I provide means cooperating with the wheel 4 to engage the open ends of the cans and substantially hold the cans in their orbit and to carry the cans around their orbit about the axis of the wheel, and while their bases are held against the face of the wheel. Such means consist of an extremely novel, flexible, endless gear device. This gear device is, in its preferred form, constructed of an endless sprocket chain 10, and which has transverse bars 11, of any desired width, and the ends of which are supported in suitable guides 12, which are shown as having inwardly opposed, recessed or channel poritions 12^a, receiving the ends of the bars 11 and not only forming the supports for the bars, but which channels form a stationary means in which the flexible sprocket gear 10 is caused to rotate in a circle which is substantially concentric to the main shaft 2.

The endless, flexible, sprocket gear 10 is shown as engaging a simple sprocket driver or pinion 13, fastened on a counter or parallel shaft 14, journaled on the frame 3, and which is clearly shown in Figure 3 as meshing with the link teeth of the flexible sprocket gear 10 and therefore forming the means by which this flexible sprocket wheel is driven without direct connection with or as to the central pulley wheel 4, with the face of which the flexible sprocket gear 10 is, for the most of its circular length, concentric, and forms the uninterrupted, circular, can-receiving space between the wheel 4 and the sprocket chain gear 10.

To the sprocket chain gear there is secured means designed to engage the open tops of the cans C as they successively or at random, singly enter the can space around the wheel 4, and serves as means for holding the can bottoms or bases against the wheel 4. This holding means is preferably of a flexible character, as is the endless sprocket gear 10, for the reason that it is desirable to provide at a portion of the gear orbit a deflected part so that, when a can comes into position between the wheel 4 and the endless gear, the upwardly protruding can contents or stock S may pass in under the encompassing, flexible gear device without being cut off or scraped out of the can due to its lateral entering movement into the can space about the wheel 4.

The can holding means is shown as including a flexible lining which may be of spaced belts 15, of any suitable material, attached to the inner faces of the flexible gear bars 11, as clearly shown in Figure 4. These flexible belts, therefore, are rigidly attached to the endless gear device 10 and travel with the same in the orbit which is defined by the channel guides or tracks 12, which are fixedly secured to the frame 3. It will thus be seen that when the cans enter the can space at the feeding station, the bases of the cans will rest on the wheel 4, and the top ends of the cans will be engaged by the retaining belts 15, which are rotatively driven at the desired rate of speed.

As shown in Figure 2, that portion of each of the guide tracks which is at the entering station for the cans is outwardly deflected at D, so as to provide for the ready passage of a can from which the contents may project, as shown, without the contents being scraped off. As soon as the can is fully presented at the loading position between the wheel 4 and the belt device 15, the can then starts its downward movement, as indicated in Figure 3 by the arrow *a*, and is held from slipping between the wheel 4 and the transporting belt or belts 15.

In operation of the machine, the water which has collected in the bottom of the cans will naturally gravitate to the lowermost side of each can as it runs through its vertical orbit, and as soon as the lowermost side portion of each radially disposed can passes below the axis of the orbit, the liquid will drain down the lowermost portion of the side of the can and thus readily flow out between the belts 15 which, to facilitate the discharge of the liquid, are shown as spaced at 15^a at their adjacent edges and therefore the liquid will run readily through the peripheral discharge aperture 15^a and be collected in and conveyed away by a suitable discharge trough T.

A form of drive for the shaft 2 is shown as including a belt 18, engaging a pulley 19 on the countershaft 14, and also engaging a pulley 20 on the main shaft 2. Secured on the main shaft, which carries the wheel 4, is a bevel gear 21, engaging another gear 22, which is secured on the shaft 23 of the feed table 5. Also secured on the shaft 2 is a bevel gear 25, engaging a gear 26, which drives a shaft 27 carrying at its upper end a discharge table or wheel 28, having an axis substantially perpendicular to the shaft 2, and which discharge disc is arranged contiguous to and just below the discharging portion of the wheel 4, so that cans coming around and engaging the guide rail 7^a will be deflected from the wheel 4 out laterally, in an oblique direction, onto the table 28 and by this be carried outwardly and onto any suitable receiving conveyor to be carried to a further part of the canning system. The cans issuing from the machine onto the discharge table 28 are deflected tangentially from the table by a guide rail 30, positioned suitably above and across the same.

The feed guide rails 6 and 7 are positioned so as to engage the cans at about their central portion, and thus do not have any tipping tendency, and the discharge rail 30 is similarly located so as to engage the cans without a tipping tendency.

The flexible, transporting belt device or flexible gear (as it may be termed) and the central wheel 4 may run at the same speed, or the transporting belt may be run at a slightly greater speed; the driving of the cans in their orbit being accomplished by and with a movement of the transporting belt device 15. It is understood that this transporting belt device may be built up in various ways, and that the present construction is illustrative of but one practical form.

I have demonstrated, by actual construction and operation of this machine, its practical use in canning operations. The machine can be installed at any desired point in a train of machines or apparatus in a canning plant, and an important feature is that the machine can be installed at any desired point and will operate upon the cans coming in untimed and in indifferent but upright positions to the machine, which is capable of receiving the cans in any order, and which will carry the cans in indeterminately spaced positions without being in direct engagement with each other, and without requiring any can spacing, timing or positioning mechanisms or parts at any portion of the machine, which is capable of running on its own rate of speed and will receive, invert and discharge the cans without in any wise mutilating the cans, jamming up the train, and effectively draining the liquid from the contents of the cans.

It will be seen that there is no direct connection between the transporting belt means and the concentric wheel 4, and these are, to all intents and purposes, wholly independent of each other, but are driven at a more or less similar rate of movement by suitable drive connections which enable the cans to be directed into the machine and carried through their orbit without in any wise being crowded.

It is obvious that cans of different diameters may be successfully run into the machine practically without adjustment of the same so long as the cans are of uniform height; it being well known that cans of different capacities and having a uniform height are generally in use.

The capacity of the machine may be increased to any desired extent without increasing its speed by merely utilizing the can carrying wheel and belt means of a width sufficient to receive any number of cans in side-by-side position across the face of the pulley, and in such case the guide rail 8 will be formed substantially as a helix, as indicated in Figure 5, so that there can be two rows or more of cans across the face of the wheel 4.

In the illustrated machine, it has a capacity of about twelve cans in a single row at one time, and this will obviously be doubled, without changing the speed of the machine, by utilizing a wheel of a width to receive two rows of cans, thus making its capacity twenty-four per revolution.

Further embodiments, modifications and variations may be resorted to within the principle of the invention.

What is claimed is:

1. In a machine for draining containers, a central, rotatable wheel onto the periphery of which the containers are adapted to be positioned, means for guiding the containers to and from the face of the wheel, and a rotary, substantially circular device concentrically spaced about the face of said wheel and adapted to engage the outer ends of the containers positioned on the wheel and carry the same around on and with the wheel, said device being without direct connection with the wheel.

2. A machine for draining containers by moving the containers through an orbit, said machine comprising means for moving the containers through a substantially circular orbit in which the containers are inverted, and means for feeding the containers to and leading the containers from the inverting means, said container-moving means including concentrically spaced rotary devices.

3. A machine for draining containers by moving the containers through an orbit, said machine comprising means for moving the containers through an orbit in which the containers are inverted, and means for feeding the containers to and leading the containers from the inverting means without positive timing of the containers, said container moving means including concentrically spaced, rotary devices which are spaced to form a circular, container-receiving chamber.

4. A machine for draining containers and which comprises a rotary, central wheel, and a rotary substantially circular transporting, driver forming means to retain the desired container contents and permit liquid to drain therefrom.

5. A machine for draining containers by moving the containers through an orbit, said machine comprising means for moving the containers through an orbit in which the containers are inverted, and means for feeding the containers to and leading the containers from the inverting means, which includes rotors not directly connected, and which are spaced to form a circular, container-receiving chamber.

6. A machine for draining containers and

which includes a central, rotatable wheel, a concentric, rotatable device surrounding the wheel and being without direct connection therewith, means for feeding the containers into the space between the wheel and said means and for carrying the drained containers therefrom, all without container timed relation.

7. A machine for draining containers and which includes a central, rotatable wheel, a concentric, rotatable device surrounding the wheel and being without direct connection therewith, and means for feeding the containers into the space between the wheel and said means and for carrying the drained containers therefrom, all without container timed relation and without positive and definite spacing of the containers about the central wheel.

8. A machine for draining containers and which includes a central, rotatable wheel, a concentric, rotatable device surrounding the wheel and being without direct connection therewith, means for feeding the containers into the space between the wheel and said means and for carrying the drained containers therefrom, all without container timed relation, and means not directly connected to the aforesaid parts and forming lateral guides for the containers while they are carried around by the said wheel and said means.

9. In a machine for draining containers, a central, rotatable wheel onto the periphery of which the containers are adapted to be positioned, means for guiding the containers to and from the face of the wheel, and a rotary, substantially circular device concentrically spaced about the face of said wheel and adapted to engage the outer ends of the containers positioned on the wheel and carry the same around on and with the wheel.

In testimony whereof I have signed my name to this specification.

ERNEST W. RICKARD.