Oct. 10, 1950 K. A. LEUSCHNER 2,525,141

CAN DRAINING MACHINE

Filed Feb. 24, 1948 4 Sheets-Sheet 1

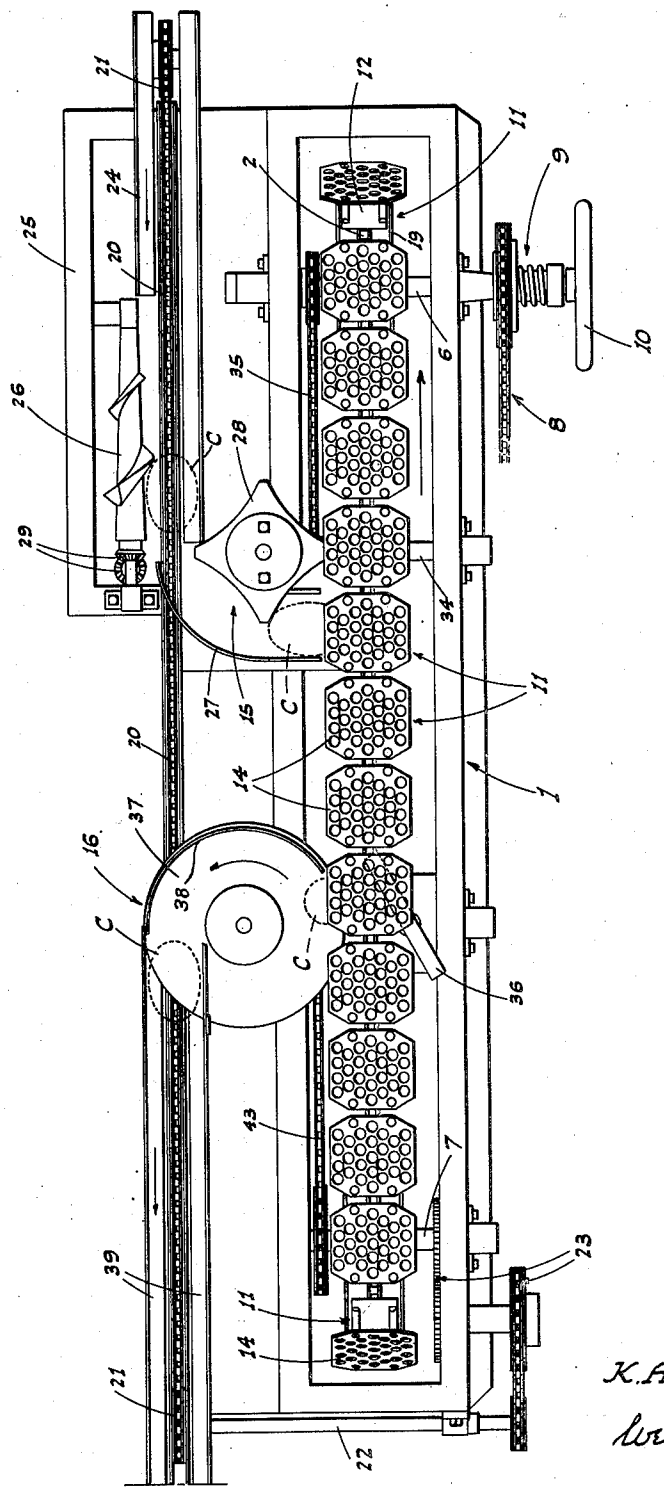


Fig. 1

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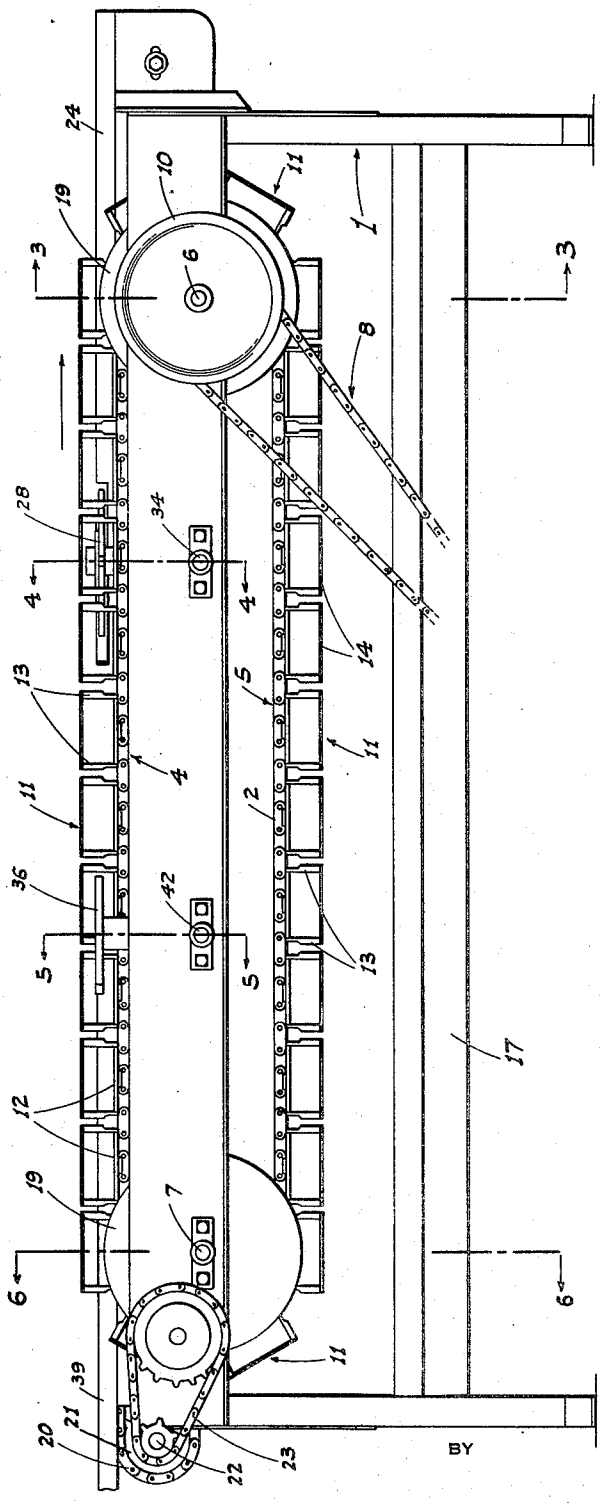


Fig. 2

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Fig. 3

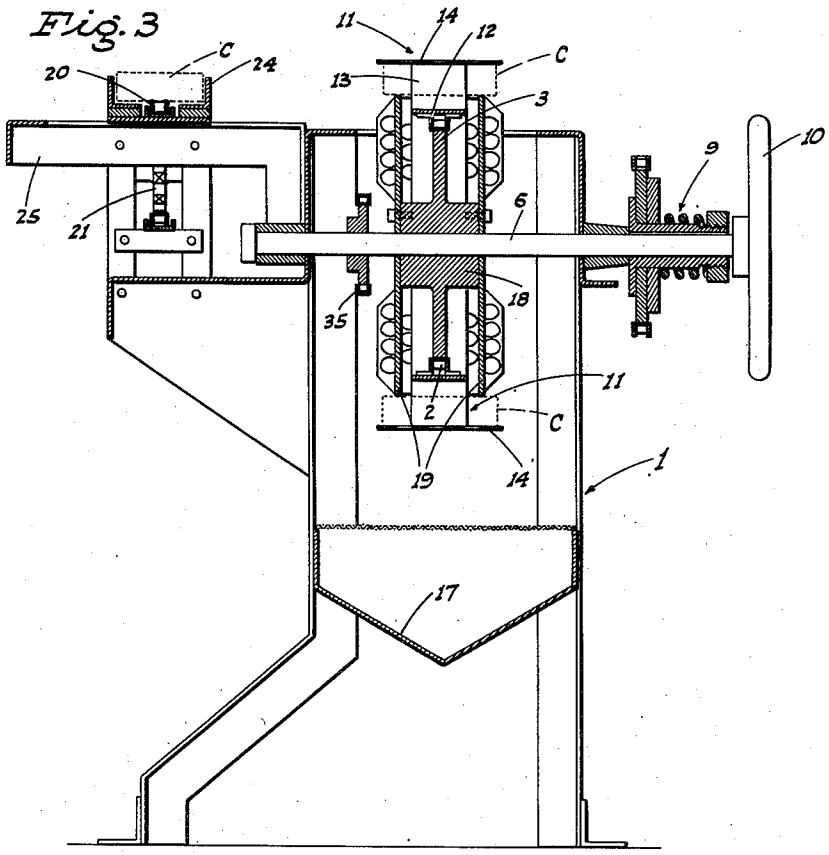
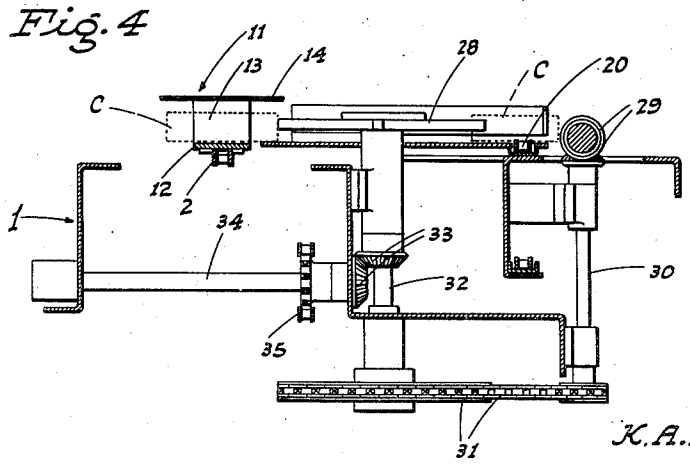


Fig. 4



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Fig. 5

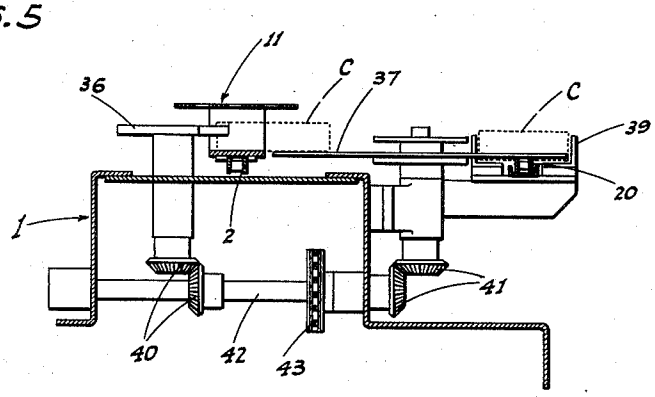
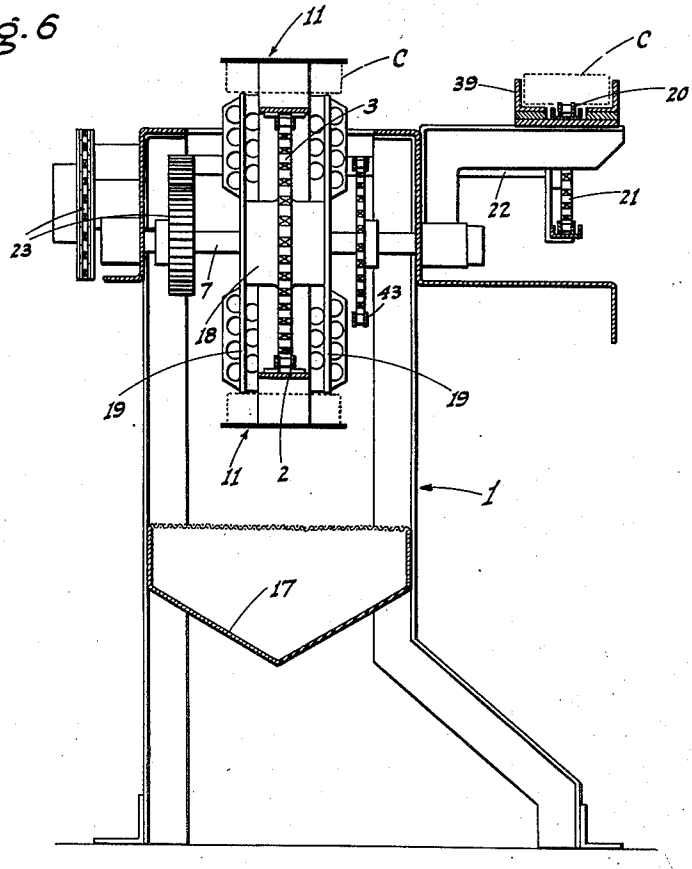


Fig. 6



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UNITED STATES PATENT OFFICE

2,525,141

CAN DRAINING MACHINE

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Application February 24, 1948, Serial No. 10,283

15 Claims. (Cl. 226—22)

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This invention relates to cannery equipment.

In particular the invention is directed to, and it is an object to provide, an improved, automatic, can draining machine operative to receive erect, open-topped but loaded cans; to invert the cans to drain excess liquids therefrom; and to then re-erect the cans for continued movement and subsequent lidding.

The invention has for a further object the provision of a can draining machine, of the longitudinally extending, vertically disposed, endless chain type, wherein a novel arrangement is provided to positively urge the cans into engagement with the drain plates as the endless chain traverses the end sprockets; this assuring against misalinement of the cans as they traverse between the upper and lower runs of the chain, and additionally positioning the cans against the initially uppermost drain plates preparatory to inversion thereof.

Another object of the invention is to provide a can draining machine which incorporates novel mechanism for feeding cans to the machine from a straight line, horizontal conveyor, and to discharge the cans back onto said conveyor, at an adjacent point, after the draining operation has been completed.

An additional object is to drive the working parts in a manner to accomplish effective, predetermined timing of the feeding and discharging of the cans, whereby the machine functions continuously, smoothly, and rapidly; being thus adaptable to interposition in a cannery line without interfering with its flow.

A further object of the invention is to provide a practical and reliable can draining machine, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a top plan view of the improved can draining machine.

Fig. 2 is a side elevation of the same.

Fig. 3 is an enlarged cross section on line 3—3 of Fig. 2.

Fig. 4 is an enlarged cross section on line 4—4 of Fig. 2.

Fig. 5 is an enlarged cross section on line 5—5 of Fig. 2.

Fig. 6 is an enlarged cross section on line 6—6 of Fig. 2.

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Referring now more particularly to the characters of reference on the drawings, the improved can draining machine comprises an upstanding, elongated main frame 1 on which is journaled a longitudinally extending, vertically disposed endless chain 2; such chain being carried, on opposite ends, by relatively large-diameter sprockets 3. The upper run of the chain 2 is indicated at 4, while the lower run of said chain is indicated at 5.

The sprockets 3 are fixed on cross shafts, one cross shaft being numbered 6 and the other cross shaft being numbered 7. The cross shaft 6 is driven from a suitable power source (not shown) by an endless chain and sprocket unit 8; there being an adjustable safety clutch unit 9 interposed between the driving arrangement 8 and said cross shaft 6. A hand wheel 10 on the cross shaft 6 permits manual operation of the endless chain 2 when necessary.

The endless chain 2 is fitted, in spaced relation, with a multiplicity of can holders, each of which is indicated generally at 11. The can holders 11 each comprise a can supporting plate 12 secured by attachment links to the chain 2; there being end walls 13 which radiate from opposite ends of the plate 12. At their outer ends, the walls 13 carry a drain plate 14 disposed in spaced, facing, symmetrical relation to the corresponding can supporting plate 12. Each can holder 11 thus forms an enclosure opening only laterally; the drain plate 14 overhanging the supporting plate 12 in the upper run 4 of the endless chain 2, but being disposed in underhanging relation when in the lower run 5 of said chain.

A cam feeding mechanism 15 and a can discharge mechanism 16, both of which are hereinafter described in detail, function to deliver erect, loaded, open-topped cans into the holders 11 at one point in the upper run 4 of the endless chain 2, and to remove or discharge said cans from said run after the cans have traveled about the chain and are again in the upper run 4 adjacent said point. When the cans are traveling in the holders 11, and in the lower run of the endless chain 2, such cans are inverted, whereby excess liquid delivers through the drain plates 14, which are perforate, and falls into a screen-topped catch trough 17 in the main frame 1 directly below said chain 2. The catch trough 17 may be arranged to feed away the accumulated excess liquids by any suitable means.

The can feeding mechanism 15 delivers to the upper run 4 of the endless chain 2 at a point ahead of the discharge mechanism 16, and the cans, as fed into the holders 11, initially rest on

the can supporting plates 12 with some clearance relative to the then uppermost drain plates 14.

In order to engage the cans directly with the drain plates 14, so as to secure the cans for travel about the sprockets 15, and to dispose the cans so that they will not have to drop against the drain plates when inverted and entering the lower run 5, the following arrangement is provided.

While adaptable to many other uses, the machine is especially designed for use with oval type cans C, as commonly used in the California sardine packing industry, and when said oval cans are placed in the holders 11, they are disposed with their major length transversely of the direction of travel, and project at opposite ends beyond the supporting plates 12; the drain plates 14 being enlarged laterally to fully lap said cans.

The sprockets 3 include hubs 18 having circular discs 19 fixed to opposite ends thereof, said discs being of somewhat greater diameter than the sprockets. The diameter of the discs 19 is such that as the can holders 11 travel about the sprocket, the corresponding pair of discs 19 engage the cans C and urge them into positive frictional engagement with the inner face of the drain plates 14. Thus, when the lower run 5 is reached, the cans C are already in engagement with the drain plates, and do not have to fall into contact therewith. In the above described manner the cans C are maintained in proper position as they traverse the sprockets, and additionally are pre-engaged with the drain plates before entering the lower run 5. At the opposite end of the endless chain 2 the corresponding discs 19 also engage the cans and hold them in position while the related sprocket is being traversed and the cans returned to the upper run 4.

The can feeding mechanism 15 comprises the following structural arrangement:

An endless chain 20 extends along one side of the machine in parallelism to the endless chain 2, such endless chain 20 being carried on end sprockets 21, one of which is driven by a cross shaft 22. In turn, the cross shaft 22 derives its rotation from the cross shaft 7 by means of a reversing gearing and endless chain and sprocket unit assembly 23, whereby the chain 20 travels opposite to chain 2.

At the lead end of the machine, i. e. the end corresponding to the cross shaft 6, the upper run of the endless chain 20 travels in a can guide channel 24, and to which channel the cans are adapted to be fed from the cannery line. The channel 24, including related parts, is supported by a lateral frame 25 fixed in connection with the main frame 1.

A power actuated can spacing spiral unit 26 is mounted on the lateral frame 25 in cooperative relation to a row of cans moving through the guide channel 24, and after passing said unit 26, said guide channel 24 turns laterally inwardly at right angles, as at 27, and is disposed in a plane to feed into the can holders 11. A vertical-axis star-wheel type feeder 28 cooperates with the channel 24 at the turn 27 to feed the cans C, one at a time, into the can holders 11. The spiral unit 26 and the feeder 28 are driven, in predetermined timed relation, to accomplish the above result in the following manner:

The can spacing spiral unit 26 is driven at one end by cooperating bevel pinions 29 connected with the upper end of a vertical spindle 30, which in turn is coupled by an endless chain and sprocket unit 31 with the lower end of the vertical spindle 32 of the feeder 28. The vertical spindle 32 is driven by cooperating bevel pinions 33, one of which is actuated by a counter-shaft 34 whose rotation is derived from the cross shaft 6 by an endless chain and sprocket unit 35.

With the above drive arrangement it will be evident that the can spacing spiral unit 26 and the feeder 28 function in predetermined timed order, to the end that the cans as delivered from the feeder 28 through the turn 27 of the channel 24 enter the holders 11 one at a time and at the proper moment. Once delivered into the holders, the cans travel with the endless chain 2, for draining of said cans in the manner hereinafter described. After the cans travel with the endless chain 2, including the lower run 5, and return to the upper run 4, said drained cans are removed or discharged by the can discharging mechanism 16, the latter being constructed and functioning as follows:

A rotary push-out finger 36 is mounted on a vertical axis and for rotation in a horizontal plane, and from the side of the endless chain 2 opposite the feeder 28 to work through each can holder 11 with passage of the latter. Thus, as each holder 11, with a drained but now erect can therein, comes abreast the rotary push-out finger 36, the latter sweeps through said holder and ejects the can therefrom. The ejected can falls onto a vertical-axis turntable 37 disposed alongside the upper run 4 of the endless chain 2 on the side opposite said finger 36. The cans as discharged onto the turntable 37 follow a path determined by an upstanding guide flange 38, which flange leads the cans into a guide channel 39, in the bottom of which a corresponding part of the endess chain 20 runs. The chain 20 thus again picks up the cans and carries them along the guide channel 39 for further handling, such as lidding, in the cannery line.

The rotary push-out finger 36 and the turntable 37 are driven in predetermined timed relation to each other and to travel of the can holders 11, as follows:

The finger 36 and turn table 37 each includes a vertical spindle driven at the lower end by sets of cooperating bevel pinions 40 and 41, respectively; such sets of pinions being actuated from a countershaft 42, which in turn is driven by an endless chain and sprocket unit 43 from the cross shaft 7.

The described can draining machine provides a very practical and convenient apparatus for the continuous draining of loaded cans in a cannery line; the machine being capable of interposition in such line at any selected point.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A can draining machine comprising a main frame, a longitudinally extending endless conveyor, means mounting the endless conveyor on

the main frame in a manner to provide an upper run and a lower run, a power drive for said endless conveyor, a plurality of can holders secured to and projecting outwardly from the endless conveyor, each can holder opening laterally and including a can supporting plate adjacent the conveyor and a perforate drain plate fixed at a point outwardly of the supporting plate in facing relation thereto, a power mechanism mounted in cooperation with the upper run of the conveyor at one point operative to feed erect, open-topped cans into the holders from the open side, another power mechanism mounted in cooperation with said upper run at a rearward point operative to discharge cans from the holders, and means working with the conveyor as the same turns between the runs operative to then lift the cans from the supporting plates and into positive engagement at their upper ends with the inner faces of the drain plates.

2. A can drainer, as in claim 1, in which the cans project laterally of one side of the holders; said last named means including discs concentric to but of greater diameter than the conveyor turns and rotating therewith for engagement with the projecting can portions.

3. A can drainer, as in claim 2, in which the cans project laterally of both sides of the holders; there being a pair of axially spaced discs at each turn for engagement with corresponding projecting can ends.

4. A can draining machine comprising a main frame, a longitudinally extending endless conveyor, means mounting the endless conveyor on the main frame in a manner to provide an upper run and a lower run, a power drive for said endless conveyor, a plurality of can holders secured to and projecting outwardly from the endless conveyor, each can holder opening laterally and including a can supporting plate adjacent the conveyor and a perforate drain plate outwardly of the supporting plate in facing relation thereto, a power mechanism mounted in cooperation with the upper run of the conveyor at one point operative to feed erect, open-topped cans into the holders from the open side, another power mechanism mounted in cooperation with said upper run at a rearward point operative to discharge cans from the holders, the conveyor being an endless chain turning at the ends about sprockets, and means working with the conveyor as the same turns between the runs operative to then cause positive engagement of the cans at their upper ends with the inner faces of the drain plates; the cans projecting laterally from opposite sides of the holders, and said last named means including a pair of discs fixed with each sprocket, the discs of each pair being on opposite sides of and greater in diameter than the corresponding sprocket whereby to engage the corresponding projecting can ends at the turns of the conveyor and to shift said cans radially outward against the drain plates.

5. A can draining machine as in claim 4 in which each holder includes connector elements between the ends of the supporting plate, and the drain plate, whereby the holder is open and unobstructed on both sides.

6. A can draining machine comprising an upstanding main frame, a first longitudinal endless conveyor journaled on the frame to provide an upper run and a lower run, a plurality of radially outwardly projecting can holders on said first conveyor adapted to be loaded and unloaded from one side thereof, a second longitudinal endless conveyor journaled on the frame to provide an upper run adjacent and parallel to the corresponding run of the main endless conveyor, power means arranged to simultaneously drive said conveyors, power driven, timed mechanism between the upper runs of the conveyors operative to transfer cans at one point from the upper run of the second conveyor to the holders on the upper run of the first conveyor, and other timed mechanism between the upper runs of the conveyors operative to transfer cans at another point from said holders on the upper run of the first conveyor to the upper run of the second conveyor after the cans have traversed the lower run of the first conveyor in inverted position.

7. A can draining machine comprising an upstanding main frame, a first longitudinal endless conveyor journaled on the frame to provide an upper run and a lower run, a plurality of radially outwardly projecting can holders on said first conveyor adapted to be loaded and unloaded from one side thereof, a second longitudinal endless conveyor journaled on the frame to provide an upper run adjacent and parallel to the corresponding run of the main endless conveyor, power means arranged to simultaneously drive said conveyors, power driven, timed mechanism between the upper runs of the conveyors operative to transfer cans at one point from the upper run of the second conveyor to the holders on the upper run of the first conveyor, and other timed mechanism between the upper runs of the conveyors operative to transfer cans at another point from said holders on the upper run of the first conveyor to the upper run of the second conveyor after the cans have traversed the lower run of the first conveyor in inverted position; the drive means for the conveyors causing travel thereof in opposite directions.

8. A can draining machine comprising an upstanding main frame, a first longitudinal endless conveyor journaled on the frame to provide an upper run and a lower run, a plurality of radially outwardly projecting can holders on said first conveyor adapted to be loaded and unloaded from one side thereof, a second longitudinal endless conveyor journaled on the frame to provide an upper run adjacent and parallel to the corresponding run of the main endless conveyor, power means arranged to simultaneously drive said conveyors, power driven, timed mechanism between the upper runs of the conveyors operative to transfer cans at one point from the upper run of the second conveyor to the holders on the upper run of the first conveyor, and other timed mechanism between the upper runs of the conveyors operative to transfer cans at another point from said holders on the upper run of the first conveyor to the upper run of the second conveyor after the cans have traversed the lower run of the first conveyor in inverted position; the upper run of the second conveyor running in a can guide channel adjacent said first named transfer mechanism, and a power driven, timed, can spacing spiral unit mounted to cooperate with cans in said channel.

9. A can draining machine comprising an upstanding main frame, a first longitudinal endless conveyor journaled on the frame to provide an upper run and a lower run, a plurality of radially outwardly projecting can holders on said first conveyor adapted to be loaded and unloaded from one side thereof, a second longitudinal endless conveyor journaled on the frame to provide an upper run adjacent and parallel

to the corresponding run of the main endless conveyor, power means arranged to simultaneously drive said conveyors, power driven, timed mechanism between the upper runs of the conveyors operative to transfer cans at one point from the upper run of the second conveyor to the holders on the upper run of the first conveyor, and other timed mechanism between the upper runs of the conveyors operative to transfer cans at another point from said holders on the upper run of the first conveyor to the upper run of the second conveyor after the cans have traversed the lower run of the first conveyor in inverted position; the upper run of the second conveyor running in a can guide channel adjacent said first named transfer mechanism, and a power driven, timed, can spacing spiral unit mounted to cooperate with cans in said channel, and said first named transfer mechanism including a turn in the channel toward the upper run of the first conveyor, and a power driven, timed star-wheel type feeder mounted on a vertical axis for working in said turn.

10. A can draining machine comprising an upstanding main frame, a first longitudinal endless conveyor journaled on the frame to provide an upper run and a lower run, a plurality of radially outwardly projecting can holders on said first conveyor adapted to be loaded and unloaded from one side thereof, a second longitudinal endless conveyor journaled on the frame to provide an upper run adjacent and parallel to the corresponding run of the main endless conveyor, power means arranged to simultaneously drive said conveyors, power driven, timed mechanism between the upper runs of the conveyors operative to transfer cans at one point from the upper run of the second conveyor to the holders on the upper run of the first conveyor, and other timed mechanism between the upper runs of the conveyors operative to transfer cans at another point from said holders on the upper run of the first conveyor to the upper run of the second conveyor after the cans have transversed the lower run of the first conveyor in inverted position; the upper run of the second conveyor running in a can guide channel adjacent said last named transfer mechanism, and the latter including a power driven, timed, turntable mounted on a vertical axis in cooperative relation between the upper runs of said conveyors, there being a can guide flange mounted to guide turntable supported cans from adjacent the holders to said channel, and a power driven, timed, can discharge unit arranged to push cans from the holder onto said turnable.

11. A can draining machine comprising an upstanding main frame, a first longitudinal endless conveyor journaled on the frame to provide an upper run and a lower run, a plurality of radially outwardly projecting can holders on said first conveyor adapted to be loaded and unloaded from one side thereof, a second longitudinal endless conveyor journaled on the frame to provide an upper run adjacent and parallel to the corresponding run of the main endless conveyor, power means arranged to simultaneously drive said conveyors, power driven, timed mechanism between the upper runs of the conveyors operative to transfer cans at one point from the upper run of the second conveyor to the holders on the upper run of the first conveyor, and other timed mechanism between the upper runs of the conveyors operative to transfer cans at another point from said holders on the upper run of the first conveyor to the upper run of the second conveyor after the cans have traversed the lower run of the first conveyor in inverted position; one of said mechanisms being driven from one end of the first conveyor, and the other of said mechanisms being driven from the other end of said first conveyor.

12. A can draining machine comprising an upstanding main frame, a first longitudinal endless conveyor journaled on the frame to provide an upper run and a lower run, a plurality of radially outwardly projecting can holders on said first conveyor adaptd to be loaded and unloaded from one side thereof, a second longitudinal endless conveyor journaled on the frame to provide an upper run adjacent and parallel to the corresponding run of the main endless conveyor, power means arranged to simultaneously drive said conveyors, power driven, timed mechanism between the upper runs of the conveyors operative to transfer cans at one point from the upper run of the second conveyor to the holders on the upper run of the first conveyor, and other timed mechanism between the upper runs of the conveyors operative to transfer cans at another point from said holders on the upper run of the first conveyor to the upper run of the second conveyor after the cans have traversed the lower run of the first conveyor in inverted position; the second conveyor being driven from the first conveyor, but in an opposite direction.

13. A can draining machine comprising a frame, an endless conveyor on the frame including an upper run and a lower run, a plurality of can holders mounted on and projecting outwardly from the conveyor, said holders being open on both sides, a power driven, timed mechanism mounted on the frame operative to feed cans into the holders at a certain point in the upper run, and a separate power driven, timed mechanism operative to discharge cans from the holders at another point in the upper run and after the cans have traversed the lower run; said last named mechanism including a rotary push-out finger mounted on a vertical axis in position to sweep into each holder from one side as the same passes.

14. A can draining machine comprising a frame, an endless conveyor on the frame including an upper run and a lower run, a plurality of can holders mounted on and projecting outwardly from the conveyor, said holders being open on both sides, a power driven, timed mechanism mounted on the frame operative to feed cans into the holders at a certain point in the upper run, and a separate power driven, timed mechanism operative to discharge cans from the holders at another point in the upper run and after the cans have traversed the lower run; said last named mechanism including a rotary push-out finger mounted on a vertical axis in position to sweep into each holder from one side as the same passes, and a can receiving turntable mounted on the opposite side of the conveyor from said push-out finger whereby to receive cans pushed out of said holders.

15. A can draining machine comprising a frame, an endless conveyor on the frame including an upper run and a lower run, a plurality of can holders mounted on and projecting outwardly from the conveyor, said holders being open on both sides, a power driven, timed mechanism mounted on the frame operative to feed cans into the holders at a certain point

in the upper run, and a separate power driven, timed mechanism operative to discharge cans from the holders at another point in the upper run and after the cans have traversed the lower run; the conveyor being an endless chain, and each can holder including a can supporting plate attached to the chain, a perforate drain plate outwardly of the supporting plate, members connecting opposite ends of the plates, each drain plate projecting laterally beyond the corresponding supporting plate, and a pair of discs concentric to the axis of the conveyor at each end thereof and disposed to project radially beyond opposite ends of the supporting plates

and directly toward the corresponding ends of the drain plates at the turns of said conveyor.

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